RELIGION, SPIRITUALITY AND AGING: A LONGITUDINAL STUDY OF MENTAL AND PHYSICAL COPING

by

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ABSTRACT

A connection to the divine, God, or nature can be a source of comfort, guidance and insight, particularly during times of hardship or illness. This study draws together sociological theories on religion, aging and health to explore the ways in which religious and spiritual practices may impact the mental and physical aspects of old age. Analyzing data from the Health and Retirement Study (HRS) from 2000 to 2010, the effects of religious salience, prayer and meditation are investigated in terms of their impact on mental health and physical functioning. Additionally the study examines a sample of cancer survivors to determine if the effects of religion differ for this unique population. Results demonstrated a salutary effect of religious salience on mental health and coping with cancer, but a negative association with disability. Similarly, moderate prayer improved outcomes of depression and disability while daily prayer and meditation was associated with poorer outcomes. Theoretical explanations for these results are discussed with respect to policy implications and future research directions.

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CHAPTER I

HOW AND WHY TO STUDY RELIGION, AGING AND HEALTH

BACKGROUND, RESEARCH QUESTIONS AND METHODS

Introduction

Spiritual and religious resources encourage reflection, clarity, and coping with aspects of suffering that are uniquely human. Religious institutions have played a key role in caring for the sick, weak, and elderly, and continue to provide a framework for navigating the external and internal world. A connection to the divine, God, or nature can be a source of comfort, guidance and insight for all people, but is particularly salient during times of hardship or illness (Koenig 2007). Although the institutions of religion and medicine are far more separate today than historically, religion and spirituality have persisted as an important aspect of health and healing. This study draws together sociological theories on religion, aging and health to explore the ways in which religious and spiritual practices may impact the mental and physical aspects of old age. This introduction outlines the significance of pursing such research, summarizes the major findings of previous research, outlines the approach of medical sociology and theoretical mechanisms in the religion-health connection, and describe

the data and methods employed for this investigation. The present study is divided into five chapters, with three primary research aims:

- Aim 1a: Investigate the main effect of religious salience on symptoms of depression and disability, assessing lifestyle and social support as sociological explanatory mechanisms.
- Aim 1b: Examine the moderating effect of religious salience on the relationships between cancer diagnosis and depression and disability.
- Aim 2a: Investigate the main effects of prayer and meditation on symptoms of depression and disability, assessing physical and mental health status as a psycho-physiological explanatory mechanism.
- Aim 2b: Examine the moderating effect of prayer and meditation on the relationship between a cancer diagnosis and depression and disability.
- Aim 3a: In a sample of cancer survivors, test the main effects of religious salience on obesity risk and physical activity.
- Aim 3b: Test the main effect of religious salience on life enjoyment of cancer survivors, testing social support and lifestyle as sociological explanatory
- mechanisms.

Background and Significance of Research

The United States and other industrialized nations have undergone an epidemiological transition, where populations tend to live longer and die from degenerative, chronic diseases (Rowland 2009). In these societies, the medical

institution has advanced to the point of significantly declining if not eradicating rates of communicable and infectious diseases. This is a time where populations are aging; the proportion of older adults (aged 65 or older) is growing rapidly in comparison to other age groups. These changes have led to the increased salience of social, health and economic issues related to aging (Olshansky, Carnes & Desequelles 2001), and a call for more systematic research on the individual and social well-being of the aged. The following section describes these demographic changes in relation to aging, chronic illness, and the use of religion and spirituality by this population in the coping process.

Epidemiological and Demographic Transitions

The empirical study of aging in terms of health and economic impact to society represents a challenge and opportunity to adapt to changing demographics. Sociological literature on aging and health has yielded policy implications that have begun to be considered at the political level (Kinsella & Phillips 2005). The United Nations has shifted its focus to policy and practical application of aging research rather than solely descriptive demographic research. (Andrews & Clark 1999). Although measurement of aging is methodologically varied (Olshansky, Carnes & Desquelles 2001), research concludes that every nation on the globe is experiencing aging, with differing rates and patterns of morbidity (Kinsella & Phillips 2005). Understanding the social factors in aging that may exert a salutary effect on health is key in this transition to an aging and increasingly chronically ill society. Social

demographers have referred to this transition as the fourth stage in the epidemiological transition (Olshansky & Ault 1986; Rogers & Hackenberg 1989), following the age of infectious diseases, the decline of infectious diseases, and the age of degenerative diseases. The fourth stage is evidenced by a growing number of older adults surviving in to the "oldest old" ages (85+). Americans are not just dying from chronic disease, they are living with it (Costa 2005; Rau et al. 2008). While historically gains in longevity and declines in mortality were largely due to public health measures (Culter & Miller 2005), which lowered the risk of communicable diseases, now gains are being made among the oldest old (Robine and Michael 2004). This means a growing number of aging persons are dealing with day-to-day life with chronic illnesses with increasing potential for survival due to social and behavioral factors.

Aging and Chronic Illness

In postepidemiological transition countries, the needs of the elderly regarding health care and social services are changing. People are living longer, and living with serious illnesses, some of which biomedical advances still cannot eradicate. Thus, studying the underlying causes of such variation in coping with old age is key. The present studies contribute to existing literature investigating social variables that help determine how older persons mentally and physically cope with aging and illness. Since the aging population—particularly those faced with life threatening, debilitating illnesses such as cancer—are at increased risk of depression and disability, those health outcomes are examined. These outcomes mutually impact each other and are

closely related to health care costs and the subjective experience of aging. Aging is now the main demographic driver of increases in health care expenditures in most industrialized nations (Mayhew 1999), and since the dependent population requires many resources related to health, more research is needed to determine the medical and nonbiomedical needs of the elderly to cope with and prevent disease. As more adults survive into old age with chronic illnesses such as cancer, quality of life and lifestyle become more important. For these reasons, this study examines the health behaviors and life enjoyment of cancer survivors. Lifestyle and spiritual well-being are increasingly a part of illness, recovery and coping. Chronic illnesses can be even more difficult to manage than the most severe acute illness due to the length of time it can interfere with daily life and the sense of self. Many researchers have encouraged a focus on policy that can help nations respond to increased illness and dependency in the older population (Bongaarts 2004). In sum, understanding the behavioral, social and spiritual factors that may buffer the mental or physical impact of aging and illness is significant on sociological and policy levels.

Chronic Illness, Religion and Spirituality

This research focuses on specific factors that may buffer mental and physical effects of aging and illness. These factors include the social institution of religion, which socializes adherents to certain health practices and encourages social integration, or private spiritual practices such as prayer and meditation. These institutions, which were historically the primary site of healing and care for the sick

(Koenig 2008), may now represent opportunities to relieve health care burden in addition to providing more emotional, mental and social support to the chronically ill elderly. Currently rates of serious chronic illnesses such as cancer are on the rise, and with mortality gains at late ages there are now over 12 million Americans living with cancer (American Cancer Society 2012). In this set of studies, the impact of both aging and acquiring cancer are investigated with respect to outcomes of depressive symptoms and functional limitations, examining potential buffering effects of religion and spirituality on these relationships. Those living with cancer undergo significant fear and existential stress in addition to the physical strains of illness (Fife & Wright 2000), while at the same time many experience spiritual growth from tribulations (Tedeschi & Calhoun 2004). Compared to the general population, cancer survivors experience higher levels of clinical depression and anxiety in addition to experiencing loss in functioning, both physically and socially (Speigel 1996). In the face of existential challenges terminal illnesses present, many patients seek a deeper meaning to their illness by turning to religion and spirituality (Albaugh 2003), which may offer comfort and a sense of control (Pargament, Koenig & Perez 1998). Although there is a rapidly growing literature on religion, aging and health, many existing studies have been cross-sectional or qualitative in nature, limiting generalizability and directionality of findings. This study seeks to rectify these limitations by analyzing a large, nationally-representative longitudinal survey of older Americans (Health and Retirement Study 2000-2010) described later in this chapter. The primary focus is to test the effects of religious salience, prayer and meditation on the likelihood of

experiencing additional depressive symptoms and acquiring additional functional limitations over time, testing the potential moderating role of religious and spiritual practice on the impact of cancer survivorship on those outcomes. Additionally, in a sample of cancer survivors only, the effects of religious salience are tested as predictors of obesity risk, physical activity, and life enjoyment—outcomes that have been associated with cancer reoccurrence and quality of life of survivors.

Defining Religion and Spirituality

While some researchers have used the words religion and spirituality as synonymous, social scientists have identified important distinctions between the two concepts (Nelson et al. 2002). Religion is typically connected to an organizational or institutional religion with a given set of beliefs and customs, and is measured by aspects such as church attendance or religious salience (the importance of religion to an individual). Within this religious domain, early religion scholar Gordon Allport proposed further distinctions of extrinsic and intrinsic religiousness, as well as public and private practices (Allport 1950). Extrinsic religion refers to the more external or social aspects of religion such as church attendance, while intrinsic religiousness refers to practices of personal devotion to God such as prayer or reading scriptures. Similarly, public religiousness is conceptualized by affiliation with a given religion or church services attendance whereas private religiousness would measure practices such as prayer, meditation, or scripture reading (Koenig, McCullough & Larson 2001). In this study the effects of religion on health are divided into a self-designed

influence of organizational and institutional religion and personal devotion. The specific independent variables used are religious salience, prayer and meditation. Religious salience, a measure of importance of religion to an individual, likely signifies an affiliation with a religious institution and is an indicator that an individual identifies with being *religious*. Prayer and meditation are measures of personal devotion, consistent with explanations in previous literature (Musick 1993). Affiliation with a specific religion is also captured in this study but is not a component of the overall analyses due to its insignificance as a predictor of variation in the studied outcomes. Church service attendance is measured as an aspect of social support in order to parse out the actual effects of identifying as religious versus the behavior of churchgoing, which does not inherently measure specific beliefs. These distinctions are made in response to theoretical mechanisms identified in previous literature as to the relationships of these constructs to mental and physical health. These mechanisms are further discussed in the theory portion of this chapter.

The term spirituality is also used to describe a relationship to religion, the divine in general, or even a relationship with nature. Previous literature, although varied in the measurement and definitions of spirituality, generally suggests that spirituality alludes to a more universal and subjective measure. This can be peace, meaning, purpose in life, or connection to God. In this way, spirituality can accompany religiosity but can also exist as an independent construct (Saucier & Skrzypinska 2006). The relationship between religion and spirituality has been likened to the relationship between medicine and health (Miller & Thoresen 2003). Thus,

spirituality is the overall dimension and religion is an institution that may serve as a vehicle or facilitator in attaining and maintaining a sense of spirituality. In fact, spirituality may exist completely outside of an institutional way of thought, as a route to meaning making that can be practiced even by self-designated atheists. The differences in the concepts of religion and spirituality are evident in empirical research on these dimensions within the elderly and chronically ill population. In a study of 1000 elderly cancer patients, those with high intrinsic religiosity had greater spiritual well-being and hope, with lesser negative moods compared to those with little intrinsic religiosity. Conversely, measures of extrinsic religiosity had no effect on well-being (Fehring, Miller & Shaw 1997). Extrinsic and institutional religiosity should not be discounted, however. With increasing biomedical technology and prevalence of facing death in institutionalized settings, alienation and isolation can result (O'Connell 1996). Studies note that organizational religious involvement in which patient are engaged with others can help relieve these effects by providing a connection to a larger community and a framework for deeper meaning in the experience of illness (Feher & Maly 1999).

Given these definitions, prayer and meditation can be tied to both religious and spiritual systems, but may also be used solely for health and a nonbiomedical intervention. Meditation, and arguably prayer (Eisenberg et al. 1998), are forms of complementary and alternative medicine (CAM). A sociological perspective defines CAM as any healing modality used to promote health that falls outside the politically dominant system of a given society. Just as religion may encourage spirituality, the

institution of biomedicine can be drawn on to encourage better health. Following this thread, there are other practices that lie outside institutionalized religion that may encourage a spiritual perspective, even domains such as astrology or the ritual use of crystals and other objects. Likewise there are practices outside biomedicine that are utilized by a large portion of society to promote health and wellness (Ruggie 2004). Research findings indicate that the use of CAM is particularly popular with the elderly and those faced with life threatening illnesses with limited biomedical "cures" such as cancer (Ernst & Cassileth 1998). A recent report showed 88% of adults aged 65 and older have used CAM (Ness et al. 2005). Two of the most common healing modalities are prayer and meditation (Barnes, Bloom & Nahin 2008). Prayer is so prevalent that it typically is not classified as CAM in analyses of studies on determinants of CAM use, which have yielded a wide variety of findings on differences between users and nonusers (Astin 1998). Beyond this descriptive data, sociological evidence is limited as to the effects of those practices on dimensions of mental and physical health among the elderly. Research on the use of religion, prayer and meditation by elderly and chronically ill populations comes from a wide variety of disciplines including epidemiology (McCoubrie & Davies 2006), gerontology (Johnson, Elbert-Avila & Tulsky 2005), public health (Strawbridge, Cohen, Shema & Kaplan 1997), oncology (Albaugh 2003), and psychology (Banthia et al. 2007).Each discipline takes a unique approach to formulating theory, hypotheses and analyzing data to answer a specific research question. The present set of studies draws on the perspective of medical sociology, which is outlined in the following section.

The Medical Sociology Approach

A sociological approach looks to social factors that explain variation in health outcomes. The present studies examine variation in aging in terms of mental and physical health, health behavior and quality of life. Here the emphasis in placed on structural institutions and social contexts that impact individual behavior and the experience of illness (Cockerham 2007). The early study of medical sociology and subsequent sociological theories on health and medicine arose out of examining the institution of medicine as an "ideal" social institution, providing insight into society as a whole (Friedson 1970). Taking this approach, the variation in health outcomes of older adults are indicative of larger social contexts bearing down on individuals. There are a variety of theoretical frameworks within medical sociology. The social science approach produces theories that transcend the traditional biomedical paradigm, examining aspects of health and illness that may be overlooked by biomedicine (Armstrong 2000). The institution of religion is one such aspect that may impact the experience of aging and chronic illness, especially given the heightened salience of religion and spirituality among the aged (Musick 1996).

The perspective of medial sociology is traditionally focused on two primary areas: socialization and social control (Straus 1957). The institution of medicine, as well as other social institutions such as education, religion, and the family, shape the way we are socialized to think about and care for our bodies. Socialization guides individuals to professionals set apart as healing agents. Social control occurs in medicine and other institutions such as mass media and social networks, which

impact the health behaviors of individuals. In line with these foci, this research examines the institution of religion in particular as an agent of both socialization and social control. These influential factors are evidenced in research on the social effects of religion and spiritual behavior. For example, those who subscribe to a religious orientation for life (i.e., indicate high religious salience) may be socialized to think of suffering as a natural part of life and an important component of religious identity (Koffman et al. 2008) or spiritual growth (McGrath & Newell 2001). This may in turn impact mental health when faced with such suffering, in the form of chronic illness or limited functioning. Religion is also strongly tied to aspects of social control, specifically in the form of health behaviors. Religious doctrines and dogmas often contain specific guidelines and suggestions related to health (Ellison & Levin 1998). For example, many religions stress sexual abstinence before marriage and abstinence from alcohol and drugs. Groups with strict guidelines about alcohol and drugs,, such as the members of the Church of Jesus Christ of Latter Day Saints and Amish communities have documented lower cancer rates (Enstrom 1978, Weston et al. 2010). Similar sects such as Seventh Day Adventists have stricter dietary guidelines, which may include vegetarianism. It is a logical theoretical assumption that followers of a particular religion may have lower incidences of illnesses that have well-established risk factors related to health behaviors such as these. Indeed, aggregate level data has supported such assumptions (Dwyer, Clarke & Miller 1990). In examining health outcomes, medical sociologists have kept up a tradition in collaborative research and theory, drawing on fields such as psychology, psychiatry,

gerontology, medicine, biology, anthropology and economics. This study reviews research from all of these fields while maintaining a sociological perspective, illuminating aspects of the social context as they relate to individual health and coping. This perspective is more specifically influenced by the sub-field of medical sociology known as the sociology of chronic illness. The next section reviews the key findings from this field as they relate to the present studies.

Sociology of Chronic Illness

The sociological study of chronic illness (and more widely, aging) fits into the larger picture of both medical sociology and sociology as a whole. The main theoretical frameworks within sociology are functionalism, conflict theory and symbolic interactionism. Each of these frameworks offers insights and specific theories of chronic illness in the aged. Functionalism brought forth the concepts of the "sick role" (Parsons 1951), or the process by which one navigates and recovers from illness, through a qualified medical practitioner. The sick role is dynamic, and can be influenced by the social context of the patient (Honig-Parnass 1981). In the case of chronic illness, in the absence of an established and solidly effective treatment to cure the affliction, patients may explore other healing options outside the biomedical institution, including preventative health behaviors, which may impact adaptation to a chronic condition. Conflict theory is closely tied to the dominance of biomedicine in America, taking into account the political and economic interests in the institution of medicine. As it becomes evident that the prevalence and experience

of chronic illness such as cancer vary across social and economic spheres, resulting inequality may be conceptualized as a conflict of interest between industries linked to the etiology and treatment of the disease (Epstein 1990). This can have bearing on the interpretation of illness, attitude toward suffering and recovery, and the incorporation of the illness into a personal narrative. For example, people affected by a chronic illness that has documented environmental factors such as toxins or nuclear energy that have corporate ties, may use this in reconstructing identities as well as for motivation and social support (Bury 1991). In these cases, the process of rationalization and coping includes gathering medical and nonbiomedical knowledge on the illness to form narrative reconstructions. This process of deriving meaning relates to the third theoretical framework, symbolic interactionism. Symbolic interactionism emphasizes meanings derived from the experience of illness. Again, when legitimized medical knowledge is limited in its explanatory power on how an illness is brought about and subsequently cured (as in the case of many cancers), perspective outside the biomedical paradigm (such as religion or alternative medical systems) may supplement patients' conceptualization of the illness (Koffman et al. 2008). This process of meaning-making can have great bearing on a patient's attitude and approach to coping with chronic illness. For example, in a study of breast cancer survivors' beliefs about the causes of their illness, 40% of the sample believed negative emotions to be a key etiological factor (Steward et al. 2001). This relates to the use of prayer, meditation, and religious visualization to increase positive emotions and increase positive coping and recovery from illness. To sum up ,the links between

the wider sociological theoretical frameworks, the sociology of chronic illness and the present study, religious doctrines, prayer and meditation all may be drawn on to increase feelings of efficacy and control within the sick role, as nonbiomedical forms of treatment and as vehicles for meaning making, all of which can impact health outcomes. These theoretical ties are further clarified in two major streams of research findings in the sociology of chronic illness: meaning and psychosocial factors in illness. The next section outlines relevant findings on both meaning and psychosocial factors as they relate to coping with chronic illness. These findings are primarily situated in the literature on the *illness experience.*

Meaning and Psychosocial Factors in Coping

Sociologists note that illness is socially constructed (Brown 1995), as evidenced by the vast variation in the interpretation and adaptation to diseases. There is at present a relatively large body of literature in the social and medical sciences focused on these variations, in what may be referred to as the illness experience (Pierret 2003). Research on the illness experience studies the subjectivity of illness, coping actions, and strategies to maintain everyday life. Religious and spiritual behavior may impact these areas by influencing how people interpret their illness, the social support they receive, and the health behaviors they engage in.

Scholars researching the illness experience have discovered differences in finding meaning and coping with illness, introducing the concept of illness narratives. In Aurthur Kleinman's seminal book *The Illness Narratives: Suffering, Healing, and the*

Human Condition, he elucidates the idea of using stories to place illness within a context of one's life story (Kleinman 1988). In *The Illness Narratives*, he recounts the qualitative experiences of many of his patients whom he saw as a physician. The central thesis derived from his many conversations with patients, is that the meanings given to illness can affect the disease process: emotional coping, approach to treatment, even survival. With regard to chronic illness in particular, meaning can "amplify or dampen symptoms, exaggerate or lessened disability, impede or facilitate treatment…these understandings often remain unexamined" (Kleinman 1988: 9). Similarly, Rosenberg recounts that in regard to experiencing such debilitating chronic illnesses as cancer, "to some…the meaning of cancer may transcend the mechanism and the ultimate ability of medicine to understand it. For such individual the meaning of cancer may lie in the evils of capitalism, of unhindered technical progress, or perhaps in failures of individual will" (Rosenberg 1986: 34). One can see how the experience of illness, as well as how illness fits into socially and individually constructed illness narratives, may come into play as the ill adjust mentally and physically to their illness. For example, if viewed as a failure of individual will, one may take steps to adjust the behavior that is believed to have caused the illness. On the other hand, a failure of will may lead to feelings of guilt and depression that may lead the ill person further away from wellness on the continuum of health. Extending the conception of illness narrative to religious orientations, an individual's spirituality or identification with a given religion may shape their interpretation of illness, which in turn may affect their adjustment psychologically and behaviorally to chronic illness

(Pargament, Smith, Koenig & Perez 1998). For example, a chronic illness may be interpreted as a punishment by God for deviating from religious principles; conversely, it may be seen as a "blessing in disguise"-a trial gifted by God so that they may further their spiritual evolution.

Another key finding that emerged from literature on the experience and sociology of chronic illness is the consideration of psychosocial factors in the interpretation, adaptation and recovery from illness (George 1996). Although outside the scope of the biomedical model, the consideration of social factors in illness may be on its way toward integrating into the mainstream medical model as well. For instance, many medical schools now include curricula related to social factors in illness prevention and treatment, such as spirituality, humane care, and alternative medicines (Ruggie 2004). There is an expansive sociological literature on the psychosocial aspects of coping (House, Landis & Umberson 1988), including social support, perceived efficacy and support, and personal control (Krause 1997). There are also social and demographic factors that determine how well a person copes with chronic illness, and these factors can interact with each other (Bartley, Blane & Montgomery 1997). For example, there are documented differences in coping with chronic illness by race and gender, and the extent to which religion and spirituality explains differences among these social categories (Musick 1996). Literature on breast cancer highlight patterns specific to women, who tend to experience higher morbidity and lower mortality than men (Arber & Cooper 1999), and for whom religion is found to be a major facet of the coping vis-à-vis emotional and social

support (Feher & Maly 1999). Spirituality and religious beliefs are an integral part of African American culture, and research reveals several differences between African Americans and Whites in terms of coping with chronic illness that can be explained in part by religion (Koffman et al. 2008). More generally, older adults, those with social support, and particularly those with religious or spiritually related support tend to adapt better to age as evidenced by their relationship with health outcomes such as mental health (Cotton et al. 1999), functional health (Benjamins 2004) and quality of life (Balboni et al. 2007, 2010).

The consideration of the psychosocial course of illness is much to the credit of advances in the field of medical sociology. The incorporation of religious themes into medical care is certainly not new. The medical institution itself arose out of the activities of religious institutions (Koenig, McCullough & Larson 2001). Over time, religion and medicine have not only grown apart, but also found themselves subject to intense debate as their respective practitioners seek an appropriate place for each in modern life. In many medical science circles, particularly psychiatry, religion was seen as a force in opposition of medical healing (Blazer 1973). As more research highlights religion as a major psychosocial factor in coping, as well as an aid to meaning-making, the time is ripe for integration of religion into the study of health and medicine. Sociologically, this agenda is not designed to prove the effectiveness of either institution in healing, but to further understand the ways in which the contexts of both biomedicine and religion impact the bodies and minds of individuals exposed to differing ideologies on health and healing. The current body of literature has come

a long way in the past few decades, and theory has begun to be established. The next section outlines the theories behind the religion and health connection.

Theory: Mechanisms, Methods and Limitations

The primary findings from the religion, spirituality and health literature contribute to a greater understanding of the processes by which religious and spiritual practices impact the patient experience of aging and chronic illness. Many qualitative studies have detected a heightened salience of religion and spirituality in aging cancer patients (Greisinger et al. 1997, Nelson et al. 2009), as they are confronted with their mortality. This use of religion has been linked to both positive and negative coping (Koenig, McCullough & Larson 2001). Aggregate-level epidemiological research provides support for a link between religion and physical health evidenced by lower mortality risk (Hummer, Rogers, Nam & Ellison 1999; Musick, House & Williams 2004). Finally, quantitative and largely cross-sectional studies have attempted to clarify links among religion, spirituality and mental health, with equivocal results. Although a large majority of studies have found a salutary effect of religion on both mental and physical health in old age (Koenig 2008), there is such variety in measurement and methods that mechanisms remain theoretically constant but empirically unclear. The binding theoretical vein within the multifaceted field of religion and health is that religion can impact health through psychological, sociological and physiological mechanisms. This section outlines each of these proposed mechanisms while noting some of the limitations of existing research.

Psychological Mechanisms

One of the ways in which religion and spirituality can impact health is through psychological mechanisms, or the promotion of positive emotions. Religion can be an important framework for people to create more meaning in life (Musick 1996), as well as provide a structure for understanding and coping with suffering (Fichter 1981). Having a relationship with God can amplify or provide inner psychological strength (Ellison & Levin 1998), which may be particularly helpful in navigating the aging process. Religion can also impact one's appraisal and assessment of stressful situations, such as debilitating physical conditions (Pargament, Smith, Koenig & Parez 1998) and thus buffer the mental health consequences. Since mental health has been shown to impact physical health through pathways such as immune function and health behaviors, mental health is a key route in which religion can affect physical conditions. For these reasons many researchers have noted psychological factors as a primary mechanism in the religion and health connection (Seybold & Hill 2001).

Sociological Mechanisms: Integration, Support and Health Behaviors

There are two main social factors proposed by researchers to explain or mediate the relationship between religion and health. These factors correspond with the two prominent theoretical pathways in which social institutions can affect health within the field of medical sociology: socialization and social control. More specifically, religion or spirituality can influence health through social integration and support, and health behavior. These mechanisms are prominent in the sociological

study of religion and health (Koenig 2008) and are often described as mediators. This signifies that in empirical studies of religion and health, the relationship may lose power or significance when variables for social support and health behaviors are added to statistical models. Rather than "explaining away" the relationship, it is theorized that religion *is* affecting health, *through* the provision of social support and its influence on positive health behaviors. The factors can also be grouped in a Durkheimian functional theoretical framework as integration and regulation, where integration refers to social support and regulation refers to the social control over health that religious institutions can exert (Idler 2006).

Religion can provide a context for social integration and social support among members. The role of social integration on health dates back within the sociological literature to Durkheims' (1898/1951) work on religion and suicide, in which the more socially integrated church members were less likely to commit suicide, and continues to be investigated today (Berkman, Glass, Brissette & Seeman 2000). Along with providing social support and integration, religious institutions are also tied to social support within institutions of marriage and family. Religious participation is related to both marriage and marital stability (Koenig & Cohen 2002), and marriage has a long-standing and well-established relationship to both physical and mental health outcomes (see reviews by House, Landis, & Umberson 1988; Waite 1995). There is also a plethora of sociological research on the salutary effect of social networks and health (Berkman & Syme 1979; Cohen et al. 1997), which helps to establish social support as a pathway between religion and health.

In part due to the epidemiological transition and the prominence of so-called "man-made" chronic disease in the United States, health behaviors are playing a major role in incidence, recovery, and coping with illness and aging. Health behaviors such as smoking and alcohol have been linked to developing various cancers (Pinto, Eakin & Mayumara 2000), and for those dealing with chronic illness, exercise can boost quality of life (Courneya & Friedenreich 1997; Young-McCaughan & Sexton 1991). Furthermore, diet has grown in its importance for health, and is related to one of the most pressing epidemiological concerns in the West: obesity, which is linked with a myriad of negative health outcomes, including increased risk of many cancers (Bianchini, Kaaks & Vanio 2009). Religious beliefs and practices may have a direct effect on health behaviors, and thus an indirect but significant effect on mental health, morbidity and mortality. Many religious denominations encourage or enforce behaviors positively related to health and discourage negative health behaviors (Koenig 2008). Whether through formal or informal mechanisms of maintaining these social norms, generally those who consider themselves very religious also believe in the importance of maintaining healthy or pure mind and body. Typical health behaviors tied to religious institutions include abstinence from smoking, alcohol and premarital sex, dietary restrictions, or the promotion of moderation in all things (Koenig, McCullough & Larson 2001). For these reasons health behaviors are included as a mediating factor in studies of religion and health outcomes. In this way, the health promoting behaviors that positively impact health are religiously motivated and represent an indirect effect of religion.

Physiological Mechanisms

A final mechanism in the religion and health connection that continues to gain more empirical steam is the physiological or biological pathway. Aided by the field of psychoneuroimmunology, which studies the way in which psychosocial variables impact physiological health, researchers have noted the potential physiological effect of religion and spirituality (Koenig & Cohen 2002). Sources documenting these effects span many different fields examining varied practices and outcomes. Case control studies of meditation have yielded results showing a connection between meditation and immune function (Solberg et al. 1995). Sociological studies have shown how social variables related to social stress can alter susceptibility to infection and disease (House, Robins & Metzner 1982). Religion and spirituality have been linked to immune function and recovery in even the most life-threatening of chronic illnesses such as HIV/AIDS (Woods et al. 1999, Dalmida, Holstad, Dilorio & Laderman 2009). Finally, experimental studies on prayer and visualization have documented an effect of spiritual experience on the mind and physical body (Droege 1991). The power of belief on the physical body has also been documented in studies reporting a placebo effect. One classic case demonstrated that belief in a cancer drug that was later found to be ineffective, effectively melted away a large cancer tumor (Klopfer 1957). The connections between mind and body fit well within the field of sociology. Social stress has been widely studied in relation to physical health, and since religion may serve as a buffer to social stress, there is a natural link between religion and physiological health. And, while affiliation with religious institutions may

have particular bearing on social support and integration, personal practices such as prayer and meditation may operate through these physiological mechanisms. These distinctions are tested in the present studies by including social support and health behaviors as mediators in the studies on religious salience and health, and physical and mental health variables as mechanisms in the study on prayer and mediation.

Debates and Research Gaps

Despite the growing body of empirical and theoretical literature on religion, aging and health, issues surrounding measurement, methodology and mechanisms remain. The measures and methods used to link religion, spirituality and well-being in the chronically ill and aged are varied and thus limit generalizability. Likewise, the theoretical mechanisms linking religion and spirituality to health remain unclear. Debates and tensions within the religion and health literature are largely due to these methodological and conceptual limitations. Additional sociological research such as the present studies can remedy these shortcomings by more clearly conceptualizing measures, using longitudinal data, and incorporating physiological mechanisms.

Although a great number of studies purport a positive relationship between spirituality and well-being in the context of chronic illness (Brady et al. 1999, Cotton et al. 1999, McClain, Rosenfeld & Breitbart 2003; McCoubrie, Davies & Andrews 1996), there is considerable overlap in measurement of spirituality and well-being. For example, in a variety of cross-sectional studies, the great majority of spirituality measures (i.e., Spiritual Well-being Scale, Existential Well-being Scale) contain

measures of well-being (i.e., "I feel very fulfilled and satisfied with my life"), which undoubtedly confound results. Further evidence of this shortcoming is found in the few studies that use a spirituality scale without inherent measures of well-being, which have reported a nonexistent relationship (Hill & Pargament 2003). To address this limitation, the present studies conceptualize religiousness in a way that remains completely separate from positive mental health or well-being. These measures include the importance of religion in one's life and the personal practices of prayer and meditation.

Another unclear dimension of the religion and health literature is the direction and mechanisms of this relationship. While public aspects of religiousness such as church attendance have been linked with prolonged survival (Strawbridge, Cohen, Shema & Kaplan 1997) and fewer functional limitations (Benjamins 2004), it may be that those in better health are simply able to attend services more frequently. This is evidenced by research by Benjamins in which better functional health was associated with more frequent attendance at religious services and poorer functional health was associated with higher religious salience (Benjamins 2004). This also indicates that for the functionally impaired, religion becomes more important while attending church becomes more difficult. The extent to which physical health influences religiousness and vice-versa cannot be found in cross-sectional analyses. The present studies respond to this dilemma by measuring religion at a baseline, then following respondents' health and behavior over time, in both cancer survivors and the general population of older adults. Additionally, church service attendance, which could

represent a proxy for good health, is used a measure of social support in this study, thereby detecting the effect of religious belief and personal engagement. Further details on the data and methods used for this study are delineated in the following section.

Methods

The following overview includes a description of the data, measures, and general design of the present set of studies. The three proceeding empirical chapters include the methods specific to each study and the placement of variables within statistical models (i.e., outcome, control, or explanatory variables).

Data

Data for this proposed study comes from the University of Michigan's Health and Retirement Study (HRS). The HRS began in 1992, and interviews over 20,000 older adults every two years. The HRS employs a multistage area probability sample design (Health and Retirement Study, 2008). This project utilizes data from waves 5 through 10, collected every two years from 2000 to 2010. In addition to the core survey administered biennially, data from the 2000 experimental module on Alternative Medicine is included in the dataset constructed for the following studies. There has only been one published study to date that has drawn on data from this supplement (Ness et al. 2005), which includes variables on frequency of prayer and meditation. This project includes participants from the cohort born during the years of 1931-1941. Each of the studies in the following chapters uses data from the HRS

sample including individuals who were born in the years 1931-1941, which included respondents selected for the study and also their current spouse or partner in order to further increase the sample size. These studies rely on data from this original HRS sample from waves 5 to 10, spanning the years 2000-2010 with interview data collected every two years. Additionally, since these studies employ longitudinal statistical techniques that require a merged, long form of the data set, I used a streamlined version of the HRS data that was created by the RAND Center for the Study of Aging. The RAND dataset contains the data from the HRS questionnaires on variables, which were overlapping with various waves. The HRS is a complex survey that has evolved over time in terms of the wording and coding of the data, and the RAND version compiles similar variables, which are cleaned and recoded so as to be consistent and comparable over time. The RAND version of the HRS data provides self-reported data on the respondents' demographics, physical and mental health, as well as finances and support. Additionally, this form of the HRS data contains imputed values for different variables that had missing data. To increase generalizability of this study I included only those who were not institutionalized and were randomly selected at the baseline of the study (2000) and had person-level sampling weights available (for additional details on HRS sampling weight logic, see Heeringa and Connor 1995). The sample used for these studies began with the original HRS sample, described above, which had 10,044 respondents in wave 5 with a response rate of 85.4%, wave 6 had 9,724 with a response rate of 86.6%, wave 7 had 9,362 with a response rate of 86.4%, wave 8 had 8,879 with a response rate of

88.6% and wave 9 had 8,493 with a response rate of 88.6%[1] (Health and Retirement Study 2011). Combining these data, the overlapping cases excluding those who died or dropped out (n=1551) was merged with wave 5 of the original HRS data to include the variable for how important religion is to the respondent or "religious salience", which although asked in numerous waves of the HRS, was not included in the RAND data. From here, the sample is further reduced and diverges into two distinct datasets for each study. The first dataset was constructed for the first two research aims, examining religious salience, prayer and meditation for all adults (Chapters II and III), and the second for investigating the third aim which analyzes only the data from respondents who had been diagnosed with cancer at some point during the study period (Chapter IV). The first dataset was restricted to those who had been randomly assigned to complete the Alternative Medicine experimental module in 2000. This experimental survey was Module 2 of 11 modules added to the survey in 2000 and each respondent completed only one module. Since the RAND version of the HRS data does not contain information about prayer, meditation, or detailed religious variables, I rely only on respondents who were assigned to this module and merge their records with those for waves 6,7,8,9 and 10. This led to a sample size of 1,156. I further restricted by respondents to those who were over 50 at the baseline year of 2000 as risk of developing cancer may be more likely at older ages, and by excluding those who had answered "yes" to the question, "has your doctor ever told you that you had cancer or a malignant tumor, other than skin cancer" in

[1] The official response rate from the 2010 HRS was not yet published as of the writing of this study.

2000 (n=221). Additional information regarding measurement of key variables is described below. Finally, I excluded those with missing data on key variables of prayer (n=5), meditation (n=1) and religious service attendance (n=1), which did not statistically change the sample. After these exclusions, the final sample included 935 respondents. This longitudinal dataset was strongly balanced. For the second dataset, I am able to increase my sample to include respondents from the RAND sample, and include only waves 5 and 10, since my analysis in this study does not model change over time. RAND data from waves 5 and 10 is combined with wave 5 of the HRS (to include religious salience as a key independent variable), leading to an initial sample of 8,493. This sample is restricted only to individuals who were 50 years of age or older (n=8,422) and answered "yes" to "has your doctor ever told you that you had cancer or a malignant tumor, other than skin cancer" by wave 10. 17.6% of the sample was diagnosed with cancer during this time period, leading to a final sample size for this dataset of 1,422.

Measures

Religion and spirituality. The primary independent variables, which assess religious participation, are religious salience, prayer and meditation[2]. Religious salience is measured by the survey question "how important is religion to you?" (recoded as 0=not important; 1=somewhat important; 3= very important). This variable has been linked to a wide array of health behaviors and has been shown to be

[2] An additional variable for religious affiliation was included in initial analyses but is not included in the current study due to nonsignificance in all analyses preformed.

an independent predictor of preventive health practices using the HRS dataset (Benjamins 2005). Prayer is assessed by the questions, "do you ever pray privately in places other than at church or synagogue?" (coded 1=yes, 0=no) and "how often do you pray privately: at least two or three times a week, at least once a week, at least once a month, or less often than that?" This variable was also recoded into three categories: those who pray, those who pray daily, and those who do not pray at all. Meditation is assessed by two questions, "do you ever meditate?" (coded 1=yes, 0=no) and "how often do you meditate: daily, at least two or three times per week, at least once a week, at least once a month, and less than once a month. The distribution of this variable was such that roughly half of those who answered yes to meditating reported daily meditation. Mirroring the variable for prayer, this variable was recoded into three categories: those who do not meditate, those who do meditate, and those who have a daily meditation practice. The three groups for this variable are those who meditate, those who meditate daily, and those who do not meditate. For both prayer and meditation, the reference groups are the individuals who do not practice these behaviors.

Cancer status. A key independent variable in this research is cancer status, used primarily to test the effects of religious salience, prayer and meditation as a moderator variable. Cancer is measured by answering "yes" to the question, "Has a doctor ever told you that you have cancer or a malignant tumor, excluding minor skin cancer?" for all waves of the survey used. Participants are dropped from the study if they had cancer at baseline in 2000 (n=1137) so that the effects of diagnosis can be

detected, compared to outcomes in adults who did not develop cancer during the study period[3].

Outcomes. The key outcomes investigated are depression, disability, life enjoyment, obesity and physical activity. Depression is measured as the number of depressive symptoms ascertained by the shortened version of the Center for Epidemiological Studies Depression Scale (CESD), which has validated across varied populations (Radloff 1977) and is typical for mental health research. This form of the CESD has been used utilizing the HRS data (Carroll et al. 2010, Choi & Kim 2007) and has been shown to be a reliable measure (Steffick 2000; Turvey, Wallace & Herzog 1999). The literal questioning of this item is: "Now think about the past week and the feelings you have experienced. Please tell me if each of the following was true for you much of the time during the past week."

1. "You felt depressed."
2. "You felt that everything you did was an effort."
3. "Your sleep was restless."
4. "You were happy."
5. "You felt lonely."
6. "You enjoyed life."
7. "You felt sad."
8. "You could not get going."

[3] An additional variable for "time since diagnosis" was used in preliminary models but dropped due to nonsignificance and the lack of additional explanatory power.

Respondents' scores were then counted, with a 1 corresponding to answering yes, with the exception of questions 4 and 6 being reverse coded. Thus, the sum of questions leads to scores ranging from 0 to 8, with a higher value corresponding to a higher count of symptoms (α=0.77)

The outcome for disability is captured in terms of functional limitations, measured by the number of Activities of Daily Living (ADLs) that are limited by a functional impairment as a continuous variable. This measure has been found to be valid (Wallace & Herzog 1995) and reliable across different populations (Phillips et al. 2011). This measure has been used by other studies employing the HRS (Covinsky, Lindquist, Dunlop & Yelin 2009) including studies that specifically examine religious variables in relation to disability (Benjamins 2004). Specifically the variable is a summary of the activities an impairment inhibits, including bathing, dressing and eating. Although there are some differences in how ADLs were assessed in early waves of the study, the measures are consistent across waves 5 though 10, used for these studies.

Other outcomes include life enjoyment, measured by the "enjoys life" dimension of the CES-D (0=no, 1=yes). Obesity is measured as having a BMI of at least 30, as defined by the World Health Organization (World Health Organization 2011).

Demographics and health. Demographic and health variables include age (including logged age to adjust for the distribution), gender (recoded 0=male, 1=female), race (coded 0=White, 1=Black, 2=Hispanic), self-rated health (recoded as

0=poor, 1=fair, 2=good, 3=very good, 4=excellent) and number of chronic conditions which include 1) high blood pressure or hypertension; 2) diabetes or high blood sugar; 3) cancer or a malignant tumor of any kind except skin cancer; 4) chronic lung disease except asthma such as chronic bronchitis or emphysema; 5) heart attack, coronary heart disease, angina, congestive heart failure, or other heart problems; 6) stroke or transient ischemic attack (TIA); 7) emotional, nervous, or psychiatric problems; and 8)arthritis or rheumatism (HRS 2008). Socioeconomic variables are education (0=less than high school, 1=high school/GED, 2=college, 3=doctorate) and wealth. Wealth is used in place of income, since the study population is largely retired. Wealth is measured by the total of all assets not including a home, and coded into brackets (0=<2,000; 1=2,001-50,000; 2=50,001-150,000; 3=151,001-300,000; 4=300,001+)[4].

Mediating variables. Social support and health behaviors act as explanatory or control variables in the following studies. Health behaviors included are smoking status (recoded 1=current smoker, 0=nonsmoker), physical activity (recoded 1=exercises vigorously at least once per week, 0=does not exercise weekly) and alcohol consumption (0=abstains, 1=drinks). Social support is measured by marital status (0=single, 1=partnered), number of living children, and church attendance (0=never attends religious services, 1=attends religious services).

[4] This coding scheme is consistent with recent research drawing on this data sample (see Sullivan 2010). A variable for health insurance status was also included in preliminary analysis but was dropped from the study.

Research design and chapter outline. The following briefly outlines the aims and methods of each subsequent chapter. The next chapter (Chapter II), "Religious Salience, Depression and Disability: Sociological Pathways," investigates the main effect of religious salience on depression and disability, testing for differences in the effect of religious salience for cancer survivors. Poisson regression is employed for detecting the net effect of religious salience on the likelihood of developing an additional depressive symptom and the likelihood of acquiring an additional functional limitation. Control variables include gender, race, age, level of education, wealth, self-rated health, functional limitations, and CES-D score. A step-wise method is employed to test the explanatory power of social support and health behavior with variables for marital status, church service attendance, drinking and smoking status, and physical activity. Interactions between a cancer diagnosis and religious salience are included to test the stress-buffering hypothesis.

Chapter III, "Prayer, Meditation, Depression and Disability: Physiological Pathways," investigates the main effects of prayer and meditation on depression and disability, testing for differences in the effect of prayer and meditation for cancer survivors. Poisson regression for longitudinal panel data is employed to determine the likelihood of developing an additional depressive symptom or functional limitation. Control variables include gender, race, age, education, wealth, marital status, and health behaviors (smoking, alcohol, physical activity). Explanatory variables, added separately to statistical models, include mental and physical health, measured by CES-D score, self-rated health, functional limitations, and number of chronic conditions.

Interactions between prayer and meditation with a cancer diagnosis are tested to detect moderating or stress-buffering effect of these practices on the relationship between a cancer diagnosis and subsequent depression and disability.

Chapter IV, "Religious Salience and Cancer Survivorship: Impact on Physical Activity, Obesity and Life Enjoyment," investigates the main effect of religious salience on life enjoyment, obesity risk and physical activity of cancer survivors. Since this study examines the health behaviors of cancer survivors who have been diagnosed in the last decade, the study sample is restricted to those who are cancer-free at baseline, in 2000. These restrictions yielded a study sample of 8,422 at baseline, and 1,496 cancer survivors in the 10th wave (2010). Logistic and OLS regression was employed for outcomes of obesity risk, likelihood of weekly physical activity, BMI and life enjoyment, controlling for outcomes at baseline. The key independent variable is religious salience (religion is *not*, *somewhat*, or *very* important). Control variables include gender, race, age, education, wealth, self-rated health, chronic conditions, ADLs (activities of daily living) and mental health (shortened CES-D score). The key mechanisms tested for the life enjoyment outcome are lifestyle and social support, which positively influence mental health and are related to religion as a social institution.

Finally, Chapter V, "Conclusions: Future Research and Policy Implications," sums up the contributions of these studies to the field of medical sociology and the broader literature on religion, aging and health. The most significant findings are addressed in terms of their implications regarding current research and health policy.

Religious institutions are suggested as components of health care in and of themselves, and suggestions are made to increase the utility of these already formed social networks in the face of concerning health care issues. The aged are a rapidly growing and vulnerable population that often looks to religion for comfort both internally and externally. In terms of private practice, the salutary impact may be lacking due to the extent to which individuals draw on those practices in times of need. Still, awareness of such ways of coping by health professionals may lead to a better experience for the older patient. Finally, limitations of the present study are discussed with respect to key areas of future study that would further both the knowledge and application of religion and health research.

CHAPTER II

RELIGIOUS SALIENCE, DEPRESSION AND DISABILITY: SOCIOLOGICAL PATHWAYS

Introduction

The stage of later life introduces a host of challenges for older adults, socially, economically, physically, mentally and spiritually. As life expectancy has increased, so has the number of older adults facing debilitating illnesses such as cancer, where role loss, social isolation and changes in day-to-day functioning ensue (Charmaz 1983; 1991). Despite early claims that the institution of religion, heavily intertwined with the beginnings of medical institutions, would recede in social prominence (Freud 1930), religion continues to be one route of comprehending and coping with these challenges of aging (Contrada et al. 2004; Idler 2006). This study investigates the extent to which religiousness may help to predict variation in mental health and physical functioning in aging Americans, and whether the effect of religion differs for cancer survivors who may be undergoing even more physical and emotional stress. While medicine and related fields such as psychology and psychiatry today are often perceived as opposing religion (Blazer 1973), some scholars have held

steadfast to the notion of religion as a primary tool in navigating life, particularly life's struggles (Koenig 2008). In *Modern Man in Search of Soul*, prominent psychologist Carl Jung maintains that for the modern individual, "it is safe to say that every one of them fell ill because he had lost that which the living religions of every age have given to their followers, and none of them has been really healed who did not regain his religious outlook" (Jung 1933: 229). This situation mirrors the sociological theory of anomie, in which norms fall away, leaving social groups with less direction and sense of coherence in their life. And yet despite the obvious trend in the West toward modernization and the decline in participation in many institutionalized religions, religion, or the present day conception of "spirituality,"[5] continues to be not only present in social worlds, but highly significant to most individuals (Koenig & Larson 2001). In fact, the importance religion has to an individual, referred to as religious salience or religious devotion, has been tied empirically to a wide variety of health outcomes including subjective health (Musick 1996), mental health (Hackney & Sanders 2003) and successful coping with illness (Fehring, Miller & Shaw 1997). As the aging population deals with illnesses that are chronic in nature, sometimes without a defined cure, in a society where death and pain are not well integrated culturally, a religious or spiritual orientation can provide a way to incorporate illness into their life narrative (O'Connell 1996). Many studies, particularly on cancer survivors, have noted that religiously affiliated belief structures can aid in

[5] Presently within social science, spirituality refers to a condition of connection to the divine or overall meaning in life, which contrasts to the traditional conception which describes deeply religious individuals such as clergy, priests and monks (Koenig 2008).

understanding suffering and death (McGrath 2003), providing solace in a social context that does little to support meaning making within our health care system.

The chronically ill elderly experience worse mental health and more limited functioning than their well counterparts (Bodurka-Bevers et al. 2000). This, coupled with social isolation and a potentially damaged sense of self can exacerbate the existential stresses normal to the aging process (Charmaz 1983; Koenig, McCullough & Larson 2001). Since religion has remained an important coping mechanism and way of life for many older adults (Idler 2006), this study examines the effects of religion on depression and disability, and if religion may positively influence the consequences of a cancer diagnosis to those outcomes. Drawing on data from the nationally-representative Health and Retirement Study (HRS) of older Americans, the study has two primary aims:

- Aim 1a: Investigate the main effects of religious salience on depressive symptoms and functional limitations.
- Aim 1b: Test social support and health behavior as mediating, explanatory factors.
- Aim 2a: Test the moderating effect of religious salience on the impact of a cancer diagnosis on depressive symptoms.
- Aim 2b: Test the moderating effect of religious salience on the impact of a cancer diagnosis on and functional limitations.

The following sections summarize existing research on this topic, as well as the theoretical framework and methods used for this study.

Background

The inclusion of psychosocial factors in health is nothing new to the field of medical sociology, although studying religious and spiritual factors is a relatively recent addition (Steensland et al. 2000). While health research in such fields as nursing and gerontology have explored spirituality with respect to the patient experience of illness, methodologically sophisticated sociological research on religion and health did not develop in earnest until the 1990s and continues to be a work in progress (Levin, Chatters & Taylor 2011). At any rate, religion and spirituality have been brought to the attention of both social scientists and health professionals as worthy of study (McGrath & Newell 2001). The rapid aging of industrialized nations has changed demographic patterns (Rowland 2009) to the point of shifting the role of medicine and the needs of patients. The medical and sociological literature remains somewhat dominated by present medical ideology that takes a biomedical focus, treating patients as hosts of disease rather than experiencing a subjective and existentially trying situation. Gerontological and palliative (end-of-life) care is of heightened importance during this time, and issues of religion and spirituality are inherently intertwined in the research and care of patients facing death and coping with chronic illnesses such as cancer. Because of the gravity and prevalence of cancer and its unique heath consequences, this study examines not only the main effects of religion on health outcomes, but the extent to which religion may buffer the negative health effects of cancer. Cancer patients consistently report the importance of religion and spirituality in dealing with their illness, although religion has tended to

exist separate from the health care setting[6] (Soeken & Carson 1986) and in many ways still is today. Facing death when in the last stage of life can induce emotional problems such as anxiety and depression, and research on the role of religion in mental and physical health of the chronically ill elderly has produced mixed results. Aside from the value of religion and spirituality to patients, religious salience has been shown to impact patients' attitudes and approaches to treatment. In this way, the intersection of religion, aging and cancer represents an important avenue of research.

Previous Research

This study examines the impact of religion on mental health, physical functioning, and coping with cancer in older adults. The study of religion, aging and illness spans multiple disciplines, and the bulk of qualitative research has been conducted in hospital or hospice settings where patients are interviewed on their experiences and attitudes toward religion in the midst of dealing with emotional and physical distress accompanying illness. This literature has investigated a multitude of chronic illnesses, although this study focuses on cancer, which has been found to have a reciprocal relationship with religion. That is, the experience of cancer can both bring individuals closer to their sense of religiosity and more disconnected with their religious community, which can bear down on their mental and physical health. In the United States, health care is taking place largely in an institutional setting, so patients' religious participation may recede (Johnson 2002). This occurs in the form

[6] This separation grew over time, departing from an era when religion and medicine were literally one in the same (Koenig 2008).

of inability to attend services, unease with engaging with religion in a hospital setting, or even conflicts with treatment (Johnson, Elbert-Avila & Tulsky 2005). However, despite the religious disengagement that can accompany old age and illness, there is mounting evidence that in confronting death and aging, an opportunity arises to look for answers surrounding suffering and explore a deeper meaning in life (McGrath 2004). Particularly for patients diagnosed with potentially terminal illnesses, illness can be a "life crisis that intensifies the search for meaning, leaving individuals predisposed to embrace religion" (McGrath 2003: 882). Indeed, researchers have documented the increasing salience of religious issues for elderly chronically ill patients. Greisinger and colleagues (1997) interviewed terminally ill cancer patients with six months or less to live, and found that spiritual and existential issues were among their top priorities. The authors comment that it appears the most important issues to cancer patients are the ones rarely explored with their physicians. In another qualitative study funded by a major cancer research organization in Australia, hospice cancer patients with blood cancers, who commonly undergo risky and painful treatment reported that their illness provoked a "spiritual quest" in which they saw the illness as a challenge and took responsibility for their healing (McGrath 2004). Therapists and social scientists alike have explored these ways in which religion can influence illness and well-being (Koenig 2007; Pargament, Koenig & Perez 1998). Research has examined effects of religion on mental health, physical health and coping with cancer. This study reviews this existing research while contributing to a better understanding of these three aspects of religion and aging.

Mental Health

Sociologists of mental health gravitate toward the idea of the social construction of mental illness, focusing on the impact of social context on mental health. Religion is one such social context, although in the mental health field religion has historically been represented as at-odds with normal psychological adjustment. For example, in seminal psychologist Sigmund Freud's classic work *Civilization and Its Discontents*, he asserts of religion, "The whole thing is so patently infantile, so incongruous with reality, that to one whose attitude to humanity is friendly it is painful to think that the great majority of mortals will never be able to rise above this view of life" (Freud 1930: 22). Freud, whose work influences innumerable psychologists and medical professionals, maintained that religion was related to neurosis, and could contribute to anxiety, fear, excessive guilt, and delay in seeking medical diagnoses and care. Freud's painful thought has played out, as the great majority of humans have not departed from a religious worldview. Today 93% of Americans believe in God or a higher power (Koenig 2008), and in recent studies, 90% of Americans used religion to cope during straining times (Stein & Jaycox 2001) and one-fifth of medical patients spontaneously reported religion as the most important factor in coping (Koenig 1998; 2008). The question of whether religion can prove to be a salutary rather than neurotic mechanism has only in the last few decades been addressed in earnest by researchers. Recent meta-analyses and reviews report that religion is related to a variety of positive mental health outcomes, including life satisfaction and lower depression and anxiety (Hackney & Sanders

2003; Smith, Poll & McCullough 2003). Studies on religious and spiritual needs in the chronically ill demonstrate a significant, positive effect of quality of life (Albaugh 2003; Brady et al. 1999), and an inverse relationship to anxiety and depression (McCoubrie & Davies 2006), especially when religious and spiritual needs are met (Balboni et al. 2010). However, despite mounting evidence of a beneficial effect of religion, the specific aspects of religion that are tied to mental health are not well understood, nor is the evidence all positive. For instance, in one study spiritual well-being was related to lower levels of anxiety and depression in cancer survivors, but religious well-being was not (McCoubrie & Davies 2006). Overall, there exists a plethora of research linking spiritual well-being to positive mental health outcomes (Koenig 2008; Nelson et al. 2002). Research focusing solely on religion, which infers a spiritual orientation that is tied to a particular religious institution, has produced both salutary and negative consequences. For example, in a study of religion, spirituality and end-of-life treatment, spiritual support was linked to higher quality of life while religiousness was linked only with the desire for all life-extending measures to be taken, some of which can impede quality of life (Balboni et al. 2007). Religion has been found to be related to active coping with illness, but unrelated to optimism or distress (Carver et al. 1993). Religious service attendance and intrinsic religiosity led to greater meaning, less anger and more social integration in one early study (Acklin, Brown & Mauger 1983), which is echoed in more recent studies on the power of meaning in combating depression (Yanez et al. 2009). Overall, although

evidence strongly points to a salutary effect of religion on mental health, there is little methodological if not theoretical consistency to existing research, making conclusions tentative.

Physical Health

There is a vast but disparate literature on the epidemiological effects of religion on physical health and functioning. Research on the connection between religion and measures of morbidity and mortality have provided an initial assessment that some religions and forms of religious participation are independent protective factors (Enstrom 1978). Bridging off of studies of psychosocial factors in healing, it has also been proposed that religious practice may have an immunological effect representing a physiological pathway in which religion or spirituality impacts health (Koenig & Cohen 2002). Finally, a small literature on religion and disability shows that religion may be an important coping mechanism with this form of health issue in part due to the emphasis on the nonphysical sense of self. Studies specifically examining religion with respect to acquiring disabilities are not only scant, but offer mixed or negative results.

Initial research on religion and health often did not specifically examine religion as an independent variable, but contained crude measures of religion such as religious affiliation. In the field of health research, this led to more focused studies on specific institutionalized religious groups, found to have lower blood pressure (Levin & Vanderpool 1989), rate of cancers (Jarvis & Northcott 1987) and risk of

stroke (Colantonio, Kasl & Ostfield 1992). Particularly in religions placing a strong emphasis on health behaviors such as abstinence from alcohol and tobacco, adherents have generally better health and lower risk of disease. This has also proved true for subjective measures of religiousness (Woods, Antoni, Ironson & Kling 1999) as well as attendance at services (Idler & Kasl 1997; Strawbridge, Cohen, Shema & Kaplan 1997). Reasons for an effect of religious measures on physical health outcomes may include better health behaviors, more social support, and the reduction of social stresses that may lead to or exacerbate illness. Even when these factors are controlled for, however, research has demonstrated a salutary net effect of religious participation on disability (Idler & Kasl 1997) and mortality (Strawbridge, Cohen, Shema & Kaplan 1997). These are arguably two of the most important measures of physical health both sociologically and clinically. However, studies on religion and physical health are not all positive. Benjamins found religious salience to be associated with more disability in older adults (Benjamins 2004), and other studies have found no effect of religion on physical heath for chronically ill adults (Koenig, McCullough & Larson 2001). These relationships may also be due to other socio-demographic variables confounding the results. Not all studies control for basic social variables found to impact health, the effect of religious participation on health could actually be an effect of gender, race, or marital status. Of course, religion and physical functioning can be mediated by variables of social support or health behavior as well, with the remaining net effect of religion representing a more robust effect of religion. In addition to sociological explanatory factors, a physiological or immunological

mechanism of religion has been proposed. This pathway will be explored in greater depth in the next chapter (Chapter Three), although it should be noted that certain forms of religious expression including prayer, religious service attendance, spiritual discussion, reading religious or spiritual literature, religious salience, and religious coping have been linked to humoral immunity, cellular immunity (i.e.CD4 cells, cytotoxic T cells, IL-6 and NK cells) and the stress hormone cortisol (Koenig & Cohen 2002).

In light of this existing research, the epidemiological and immunological effects of religion can theoretically lessen the likelihood of functional impairment in older age. Research on the functioning of the elderly with respect to religion has not supported this line of reasoning. Although many studies show that older adults with disabilities face emotional strain that causes them to rely more on religion, it is less clear what the direct relationship of religion to disability is. There is evidence to support the claim that religion may slow the progression of impairment, although most research measures religion by service attendance which may filter out the most disabled (who cannot attend church). At any rate, the tensions in the literature on religion and disability make this an exciting outcome for investigation.

Coping with Cancer

Cancer can both lead to social isolation that takes survivors away from social activities and serve as a catalyst for self-development (McGrath 2004). At a more internal level, cancer can provoke serious existential challenges and many survivors

rely on religion and spirituality to make sense out of their situation (Fife 1994). There is of course ample evidence that cancer produces physical impairment, emotional disturbance, role loss, and increased risk for other chronic illnesses (Bodurka-Bevers at al. 2000). At the same time much variation has been discovered in the ways individuals cope with cancer. For some, it is a life destroying force that can be so great, faith in God and religion is compromised. Yet for others, cancer is a spiritual quest that brings one closer to the divine (McGrath 2004). Conceptions of illness, which often bear down on one's psychological and physical coping, are a vital component of the sociological approach to studying chronic illness. Bury (1991) outlines two types of meanings stemming from the patient's understanding of their illness: consequences and significance. Consequences involve how the illness impacts daily life and functioning, information gathering, and mobilization of necessary resources and support for recovery. Significance relates to the connotations and imagery associated with the illness. Religious resources and spiritual frameworks may play a part in these perceptions and emotional responses, which can in turn affect the progression of the disease and subsequent impairments.

While many studies show a consistent positive relationship between religion and depression, as well as anxiety among the chronically ill elderly (Koenig & Larson 2001; McCoubrie & Davies 2006), negative psychological effects have also been found (Contrada et al. 2004). The impact of religious participation is mediated by the type of religiosity, conceptualized by Allport's (1950) classic and still relevant distinction between extrinsic and intrinsic religiosity. Extrinsic religiosity pertains to

organizational religious behavior such as attendance at religious services. Intrinsic religiosity related to personal spiritual feelings such as a connection with God. Religious salience may be an indicator of both. Importance of religion is a personal, subjective measure, while religious (rather than spiritual) implies some organizational affiliation. In research studies, intrinsic religiosity has been found to be inversely related to depression in cancer survivors while extrinsic religiosity produces a nonexistent or exacerbated effect on depression (Acklin, Brown & Mauger 1983). Similarly spirituality, rather than religiosity, is associated with greater well-being in cancer survivors (Balboni et al. 2007). This study adds to these conflicting results by modeling religious salience as a moderator in the examination of the effect a cancer diagnosis has on depressive symptoms and functional impairments in older adults.

Limits of Existing Research

Taken as a whole, existing research on the religion and health connection has come a remarkably long way in the past two decades. Departing from a point of separation and in many cases strong opposition from medical fields, the study of religion and health has become increasingly respected among social science researchers and medical professionals alike. In fact, of the 162 accredited medical schools in the United States, 78 now offer courses on religion and spirituality with respect to health. Despite the improvements in methodology, operationalization and theory in the field, several notable limitations still exist in this literature, and the

present study attempts to rectify at least some of these challenges. The key issues are measurement, causality, and representativeness.

The bulk of the religion and health literature uses religious service attendance, religious salience, and spiritual well-being as measures. This has sparked a number of debates within the field. Measures of church attendance, for example, may not be true indicators of religious belief, since some attend because of a spouse or for the social support in general. Church attendance may also be a proxy for good mental or physical health, rather than the cause of such conditions. This has been brought up particularly in the disability literature where it is proposed that only those in good functional health attend church. With regard to measures of spirituality, many of these measures in and of themselves are indicators of well-being, a subject that has caught the attention of researchers recently[7] (Hill & Pargament 2003). This seriously confounds studies linking spirituality and well-being.

Causality remains an issue due to the fact that a large majority of studies are cross-sectional and thus correlational in nature. This is a major issue when taken together with the research on reliance on religion to cope. That is, studies may demonstrate a correlation between negative health conditions such as depression or disability and high levels of religiosity simply because religious participation may be used more during those times. In addition to the need for more longitudinal data, national representation is lacking in many studies of cancer survivors since research is conducted primarily in hospital or hospice centers. This bias is evident in smaller

[7] This issue is elucidated further in Chapter I, page 25.

scale studies with limited racial, socioeconomic and gender diversity. This study is able to capitalize on an existing nationally representative and longitudinal study in response to these limitations. Additionally, the use of religious salience as the primary indicator of religion serves as a measure of organizational affiliation, with private practices such as prayer and meditation studied separately (see Chapter III). This study measures salience at baseline, so as to limit the contamination from any increase in salience in response to heightened depression, disability, or cancer. Finally, confounders such as social support and health behavior are modeled as mediators of the religion and health connection, with religious service attendance as a component of social support. In this way the effects of religious beliefs can be parsed out from the effect of church service attendance, which remains the main salutary religious factor in health research thus far. This strategy is elaborated on in the proceeding theoretical and methodological sections of this chapter.

Theory

The proposition that religious salience may impact health is informed by Antonovsky's (1979) theory of Sense of Coherence as well as the Stress-Buffering Hypothesis (Cohen & Willis 1985). Additionally, sociology proposes two primary explanatory or mediating factors in the religion-health relationship: social support and lifestyle (also referred to as integration and regulation). This section overviews theory on how Sense of Coherence and meaning relate to religion and coping with older age, describes the mechanisms of social support and health behavior, and briefly outlines

the stress-buffering hypothesis, tested in this study with respect to cancer as a stressful event.

Meaning

One of the ways that religion is theorized to affect health is through the construction of meaning and the improvement of a Sense of Coherence. Antonovsky's theory of the Sense of Coherence refers to an overall sense of meaning, coherence, and manageability in life and has been linked to a wide variety of health outcomes (Antonovksy 1979) including mediating the relationships between imagery, immune function and cancer outcomes (Post-White 1998). This theory echoes Viktor Frankl's (1973; 1992) work on the importance of meaning in coping with even the most dreadful of life circumstances[8]. Meaning has been researched in samples of cancer survivors and has been linked to positive adjustment (Yanez et al. 2009). It is not a theoretical stretch to connect religion with meaning, although some studies have examined religious meaning in particular. Krause (1996) found religion to be associated with better overall health in a sample of older adults, and religious meaning was the most predictive of well-being. Religion may be important for elders in constructing meaning that can help

> a person see the larger reasons for difficult situations that lie beyond their own immediate concerns, expectations and aspirations. Attaining these insights, and believing their lives fit into a larger plan or purposes, may be a source of significant personal growth for some individuals. Realizing that one has grown

[8] For example, experiencing the Holocaust, a point of departure for much of Viktor Frankl's work (Frankl 1992).

> in the face of adversity may, in turn, be an important source of life satisfaction" (Krause 2003: S161).

Thus, religious salience in this study is used because of its tie to the theory that religion is important for meaning-making, which in turn affects health in a beneficial way.

Social Support

Sociologists have noted, "religion's promotion of social support, a sense of belonging and convivial fellowship" (Levin 1994: 9). Within sociology, there is a longstanding tradition of epidemiological research showing a salutary impact of social relationships on both mental and physical health. This dates back to Durkheim's (1898/1951) influential study on religion, social integration and suicide. The physiological connection of social support and health was pioneered by Cassel's (1976) seminal article on the social factors in susceptibility to illness. Cassel outlined several pathways, such as deprivation of meaningful contact and bereavement, both of which are impacted by old age, cancer and religious involvement. While Cassel focused on the effects of a lack of social contacts, Berkman's work on social networks (Berkman & Syme 1979; Berkman, Glass, Brissette & Seeman 2000) and more recently Speigels' (1996) studies on breast cancer survivors support the notion that conversely more social support leads to positive outcomes. Social participation in religious activities has been found to buffer mortality, even controlling for age, sex, body mass index, education and race (Strawbridge, Cohen, Shema & Kaplan 1997). A multitude of other studies have linked social support with lower mortality risk

(Berkman & Syme 1979, House 2001; House, Robins, Metzner 1982; House, Landis, Umberson 1988; Seeman 2000). For older adults, social support can reduce the risk of having difficulty performing daily activities and increased likelihood of recovery from a disability (Medes de Leon et al. 1999). In general, more socially integrated people tend to be in better health, and since religion is intimately related to social integration, social support is one theorized mechanism in the religion-health connection.

Health Behavior

Another key pathway by which religion can influence health is through the promotion of healthy behaviors. Mounting research points to health behaviors or lifestyle factors as integral to both the causes and the consequences of chronic illnesses (Anand et al. 2008). In addition to doctrines and scriptures emphasizing a healthy mind and body and abstention from unhealthy habits such as smoking, alcohol and premarital sex, religion can provide both a social context and spiritual motivator toward better health. Because of this, certain religious groups experience lower rates of cancer (Koenig, McCullough & Larson 2001, Enstrom 1978) and lower mortality (Strawbridge, Cohen, Shema & Kaplan 1997, Hummer, Rogers, Nam & Ellison 1999), which has also been found to be lower in religiously concentrated geographic areas (Dwyer 1990). Recent research has shown religious institutions and messages can be effective in encouraging health-seeking behavior among members (Ayers et al. 2002; Koenig & Lawson 2004). In the chronically ill and aged, lifestyle

factors can impact depression, functional impairment and overall quality of life (Pinto, Eakin & Mayumara 2000). For example, aerobic exercise is associated with better quality of life in breast cancer patients (Young-McCaughan & Sexton 1991). Because of the relationship between religion and health behavior and the documented impact of lifestyle on health, health behaviors are proposed as a mediating factor.

Stress Buffering Approach

This study not only examines the main effects of religious salience, but also its potential as a moderating variable in the relationship of a cancer diagnosis to depression and disability. This strategy utilizes the Stress-Buffering Approach, which posits that the more stress in a person's life, the more influential religion is (Cohen & Willis 1985). Sociologist Peggy Thoits notes that there are three major stressors: life events, chronic strains and daily hassles. Old age yields many stressors, and cancer can signify all three. Chronic strains are "studied less than life events, they are damaging both to mental and physical health" (Thoits 1995: 61). Indeed, while a cancer diagnosis can be considered a life event, given medical advances it is also a chronic strain that can last years, even decades. Researchers using this approach hypothesize that religion, "may be more important for individuals in poor health. Poor health may lead to greater stress through numerous pathways including the inability to work, social isolation, financial difficulties, and fear of pain and death" (Benjamins 2004: 363). Religion relates to the coping strategies outlined in the sociology of coping literature, including social and personal characteristics, behaviors

and thoughts, and habit patterns. Religious frameworks promote social and personal characteristics such as hope and love, behaviors and thoughts such as prayer, gratitude and a connection to the divine, and habit patterns such as moderation in all things. These mechanisms may have a powerful effect on coping with cancer. In light of this, it is theorized that those who receive a cancer diagnosis will be under significantly more

stress and thus the effect of religion on depression and disability will be stronger.

Hypotheses

The existing research and theoretical frameworks drawn on for this study lead to four central hypotheses:

Hypothesis 1: Higher religious salience will correspond to a reduction in odds of acquiring additional depressive symptoms over time.

Hypothesis 2: Religious salience will moderate the effect of a cancer diagnosis on depressive symptoms.

Hypothesis 3: Higher religious salience will correspond to a reduction in odds of acquiring additional functional limitations over time.

Hypothesis 4: Religious salience will moderate the effect of cancer diagnosis on functional limitations.

Methods

This study responds to limitations of previous studies on this topic by analyzing a nationally-representative sample, using a step-wise approach to test specific mediating variables, and using a longitudinal approach that measures change over time. The specific data and measures used as well as the analytical plan are detailed below.

Data and Measures

Data used for this study including the measurement of the primary independent variable of religious salience and control variables has already been described in Chapter I of this set of studies. These variables include gender, age, race/ethnicity (White, African American or Hispanic with White as the reference group), highest level of education completed, and wealth. Educational categories are less than high school, high school/GED, college, and graduate school. The wealth variable is recoded into categories consistent with previous literature using this dataset (Sullivan 2010). Controls also include health measures: self-rated health, depressive symptoms (for the functional limitations models) and functional limitations (for the depression models).

Explanatory mechanisms of social support and lifestyle are tested, measured by marital status, attendance at church services, smoking status, alcohol consumption and weekly exercise. Finally, the two outcomes are depression and disability, as described in the methods section of Chapter I.

Analytical Plan

The statistical strategy employed for this study is a product of the dataset and theoretical framework. Since the data are made up of five combined waves, variant variables represent the effect of change over time on outcomes. To test the theoretical mechanisms variables are added in a step-wise fashion below. Descriptive analyses were performed on all variables used in the study, and differences were detected by level of religious salience using ANOVA. Since both depressive symptoms and functional limitations are count variables and in this dataset are positively skewed, Poisson regression is employed (Allison 2009). Poisson regression is a more appropriate statistical technique than linear regression in such cases (Allison 2009), although to deal with potential over-dispersion of the dependent variables, I also employ negative binomial regression as a sensitivity test. To test the explanatory power of social support and lifestyle as mechanisms, those variables were added separately to the models. To test the moderating effect of religion on the effect of a cancer diagnosis to outcomes, interactions between religious salience and cancer diagnosis were also included. That equates to four models total: Model 1 showing the initial effect of religious salience only, Model 2 adding control variables, Model 3 adding explanatory factors and Model 4 adding interactions. The author performed all statistical modeling using STATA Version 11 between July 2011 and April 2012.

Results

As a whole, the study sample of 935 older adults was made up of 58% females, 87.4% White with 9.6% African American and 3% Hispanic with mean age at baseline of 62.5 (see Table 1). Of respondents in the sample 46% had at least some college education, and the mean wealth (excluding housing) was $428,000 at the study baseline (2000). Married or partnered respondents made up 87% of the sample, which had an average of 3.3 living children. 73.7% attended religious services at least one per week in 2000. At this baseline, the average number of depressive symptoms was 1.2, the average functional limitations .2, and average number of chronic conditions was 1.3, with 53.9% of the sample self-reportedly in good or excellent health. About half of the study sample was exercising at least once per week at baseline, with only 13.7% currently smoking and 43.4% abstaining completely from alcohol. ANOVA and Bonferroni estimates were used to detect any baseline differences by religious salience in the sample. Respondents who did not feel religion to be important in their life were compared to those who felt religion was "somewhat" or "very" important. The groups did not differ in terms of age, gender or marital status, although there were proportionately more African Americans and Hispanics believing religion to be "very" important (see Table 2). Those who did not feel religion to be important in their life at all tended to be significantly ($p<.001$) more highly educated, wealthier, with fewer children and lesser likelihood to ever attend religious services. In terms of health status and behaviors, the only significant difference was in alcohol consumption, where as can be expected the group with the

highest religious salience (considered religion "very" important) had a greater proportion abstaining from alcohol. There was a moderately significant ($p<.10$) difference in self-rated health and functional limitations, with the "very" religious having somewhat worse self-rated health and more limitations.

Religious Salience and Depressive Symptoms

The bivariate relationship between religious salience and depressive symptoms showed a slight negative effect of being "somewhat" religious, which corresponded to a 10% increase in odds of acquiring an additional depressive symptom over time (see Table 3). However, when controls were added in Model 2, this disappeared, and instead the "very" religious group proved to have over 20% lower odds ($p<.001$, CI: .73-.86) of developing an additional depressive symptom compared to the nonreligious. Females were 50% more likely to be more depressed, and Hispanics were 17% more likely to ($p<.05$). As could be expected, moving a step down in self rated health and acquiring an additional functional limitation resulted in 52% ($p<.001$) and 17% ($p<.001$) likelihood of developing an additional depressive symptom, respectively. In Model 3, the explanatory factors of social support and lifestyle were added to the model to determine their role in the relationship between religious salience and depression. Indeed, this model reveals a slight drop in the advantage of the very religious, who still maintained 17% lessser odds ($p<.001$, CI:.76-.90) of nonreligious people in their likelihood of acquiring additional depressive symptoms. This provides support for Hypothesis 1. The same

demographic patterns were found in other covariates, and the social support and lifestyle variables were all significant. Marital status and church service attendance resulted in lesser likelihood of increased depression, as well as exercise and minimally, drinking, with smokers having greater odds of depression over time. This suggests that for the very religious, social support and lifestyle play at least a small part in its role in preventing depression in older adults.

A key goal of this study was to determine if religion might serve as a buffer for depression in respondents who had been diagnosed with cancer. The stress buffering hypothesis posits that the beneficial effect of religion on mental health may be particularly strong in persons confronted by serious life stress such as a life threatening or debilitating illness. While, again, similar patterns emerged in terms of other covariates as in previous models, Model 4 shows that getting diagnosed with cancer is linked to a 39% greater chance of developing an additional depressive symptom. And, both the somewhat and the very religious groups had significantly lower odds of developing additional symptoms when compared to the nonreligious. This supports Hypothesis 2. In fact, for cancer survivors, the somewhat religious had a 43% ($p<.001$, CI: .54-.73) lesser odds of acquiring an additional depressive symptom, and the very religious had 39% ($p<.001$, CI: .50-.75) lesser odds. This evidence suggests that for older adults diagnosed with cancer, religion may play a key role in avoiding the typical increases in depression that accompany the diagnosis and experience of cancer.

Religious Salience and Functional Limitations

Contrary to hypothesized results but congruent with one previous study (Benjamins 2004), the initial relationship between religiousness and functional limitations was negative. That is, the higher the religious salience, the greater the likelihood was that the participant would acquire an additional functional limitation (see Table 4). The somewhat religious were 41% more likely ($p<.01$, CI: 1.10-1.81) and very religious more than twice as likely ($p<.001$, CI: 1.69-2.67) as the nonreligious to acquire an additional functional limitation over the study period (2000-2010). When controls are added in Model 2, including gender, age, race, socioeconomic and health status, religiousness remained an independent predictor of future impairment. Odds of an acquiring an additional limitation were 56% and 63% higher (both $p<.001$, CI: 1.22-2.01, 1.29-2.06) for the somewhat and very religious respectively, as compared to the nonreligious. Hispanic race, higher education and higher wealth buffered acquired limitations. Worse self-rated health, depression, and older age were positively related to accruing a disability.

In line with this study's theoretical framework, social support and lifestyle were added separately to the third model to test their explanatory power in the effect of religious salience on disability. With the explanatory variables of marital status, church service attendance, exercise, smoking and drinking status, the effect of religious salience was still related to higher odds of acquiring a functional limitation. Model 3 shows that both the somewhat and the very religious groups, compared to the nonreligious, were about twice as likely to gain functional limitations ($p<.001$, CI:

1.46-2.62, 1.54-2.73, respectively), which rejects Hypothesis 3. While the social support variables were not significant, exercisers had lower than half the odds of nonexercisers of acquiring functional limitations, and those who smoked or drank also had slightly lesser odds. The addition of these explanatory variables explained slightly more variation that the controls model (Model 2). Essentially the explanatory factors model brought the effects of salience back up to the original model, which suggests that lifestyle is a pathway in which religion impacts disability. However, in this case the lifestyle factors that are preventative in disability are not behaviors practiced more by the more religious respondents in this study.

The fourth and final model demonstrates the effectiveness of placing high importance on religion in one's life in preventing further impairment physically due to cancer. Keeping in mind that this sample was cancer-free at the study baseline in 2000, the last model examines the effect receiving a cancer diagnosis has on future impairment. More importantly, interactions between a cancer diagnosis and religious salience tested the moderating effect of religious salience. In other words, do those who are diagnosed with cancer have a higher risk of accruing another functional limitation? And, are more religious cancer survivors protected from that risk? As can be expected, a cancer diagnosis more than tripled odds of acquiring an additional functional limitation ($p<.001$, CI: 1.84-5.44). Within this group of cancer survivors (those diagnosed with cancer), compared to the nonreligious survivors, the somewhat religious have an 86% lower chance of an additional limitation and the very religious have 81% lesser risk (both at $p<.001$, CI: .06-.29, .11-.36). This translates to religious

persons having roughly 1/5 the risk of nonreligious persons to acquire an additional functional limitation resulting from cancer. This provides partial support for Hypothesis 4. Although the religious cancer survivors are not totally protected from disability, the negative association of religious salience to disability is considerably less in cancer survivors. For all analyses, negative binomial regression analyses did not reveal distinctly different results from the Poisson regression, and those results are not included in this discussion but are available upon request.

Discussion

The results of this study contribute to a bourgeoning but conflicting literature on religion and health. Findings indicate that socio-demographically, the study sample showed little variation by religious salience at the study baseline in 2000. The majority attended religious services and were married, with a relatively low average of both depressive symptoms and functional limitations. Nonwhite races tended to be more religious while the nonreligious participants tended to be in a higher socioeconomic class. Of note, at the beginning of the study the most religious groups also had moderately worse self-rated health and more functional limitations. The primary goal of this study was to detect differences in the subsequent likelihood of this sample to acquire additional depressive symptoms or disabilities measured in terms of daily activities that are limited due to impairment. Specifically, religious salience, a widely used measure of religiousness that captures the importance of such a framework to an individual, was hypothesized to relate to said health outcomes.

Religiousness was hypothesized to impact depression and disability through the provision of meaning, social support and health behaviors. Although these mechanisms are theoretically well established in the religion and health literature, at least in sociology, previous research has not yet culminated with an empirically founded set of the most important pathways that religion impacts mental and physical health. Furthermore, this study investigated the possibility that the effect of religion on health would be greater for those who are assumed to be going through greater psychosocial stress. This was tested by examining if religion impacted depression and disability in a different way for those who were diagnosed with cancer during the study period (2000-2010).

The first hypothesis, that higher religious salience will be related to lesser odds of an increase in depressive symptoms, received partial support and was dependent on the level of religiousness. While the somewhat religious group had a slightly higher risk of becoming more depressed, but not significantly, the very religious had a significantly lower odds of acquiring an additional depressive symptom than the nonreligious. The contribution of social support and health behaviors as explanatory factors in this advantage was also modest. While the protective effect of high religious salience on depression remained after social support and health behavior were taken into account, the advantage decreased by 3%. Being married and attending church, behaviors that have been associated with higher religiousness were associated with lesser odds of becoming more depressed. This lends support for the idea that religion alters the odds of depression by the provision of social support.

Physical activity and not smoking also prove to buffer depression as other studies have reported (Courneya & Friedenreich 1997), suggesting that perhaps due to the lowest smoking rate being the very religious, health behavior is another established mechanism in this relationship. A multitude of previous studies have indicated a salutary effect of religion or spirituality on depression (Feher &Maly 1999; Ferhring, Miller & Shaw 1997). What makes findings in the current study unique is that the measure of religion is its importance to the individual. Other studies that have used a measure of religiousness that is highly correlated with well-being or one that is sensitive to depression itself (Hill & Pargament 2003) may be obscuring the actual relationship of religiousness and mental health. It appears that social support and lifestyle play a small part in why the more religious older adults are less likely to acquire more depressive symptoms over time, but the large unexplained variation suggests that other theoretical mechanisms are important. It was theorized in this study that meaning was a key mechanism that could not be adequately tested given the constraints of the dataset. Since religiousness has been proposed to be associated with meaning, it stands that in this case religion may be protective against depression, which has been both theoretically and empirically related to better mental health in a wide variety of populations including older adults (Yanez et al. 2009).

The second hypothesis of this study was that religious salience would moderate the effect of a cancer diagnosis on depression. The relationship between cancer and depression has been well documented (Bodurka-Bevers et al. 2000) and holds true for this study as well. Findings provide strong support for this hypothesis,

which contributes to other studies showing evidence for the stress buffering effect (Smith, Poll & McCullough 2003). That is, cancer survivors were more likely than cancer free adults to show an increase in depressive symptoms over time by at least one symptom. Of these cancer survivors, both the somewhat and very religious had significantly lesser odds of developing an additional depressive symptom that their nonreligious counterparts. Taken together with the main effects of both religious salience and cancer, these findings indicate that for some, religion can buffer the impact of cancer on mental health completely. Religion, whether for its role in meaning or its influence on behaviors, serves as a protective mechanism against depression for the vulnerable cancer population.

The third hypothesis posited that higher religious salience would be tied to lesser odds of acquiring functional limitations over time, and did not receive support from study findings. In fact, the initial relationship between religiousness and functional limitations was negative with the more religious more likely to see an increase in limitations. These findings are consistent with another study finding religious salience to be associated with greater disability (Benjamins 2004). The negative effect of religiousness on functional limitations was not explained by social support or health behaviors in the way this study theorized. While it was theorized that better health behaviors and more social support might lead to religiousness buffering disability, the health behaviors that did buffer disability, exercise and moderate drinking, were not concentrated in the more religious groups. These results echo the links between exercise and both mental and physical health particularly in

older adults and cancer survivors (Courneya & Friedenreich 1997, Goldberg & Elliot 1994, Shepard 1993, Young-McCaughan & Sexton 1991). The relationship between higher religious salience and lesser likelihood of exercise is explored further in Chapter IV of this set of studies, which further investigates the main effect of religious salience on exercise and obesity risk.

The fourth and final hypothesis in this study was that religious salience would moderate the relationship between a cancer diagnosis and disability. This hypothesis received partial support from these analyses. In line with previous research, cancer was found to be related to far higher odds of acquiring a disability than the cancer free counterparts. Of those diagnosed, the religious persons compared to the nonreligious had about 1/5 the odds of developing a additional limitation. This contributes to our understanding of the stress buffering effect of religion, as findings support this notion that has been rarely tested with respect to functional limitations. Measures of social support were not significant in this interaction model, however it may be that when faced with cancer, religious people have other types of support that enable them to do their daily activities more than nonreligious people. Additionally, negative coping behaviors such as excessive drinking or smoking may not be used by the very religious, resulting in a protective effect on disability.

There remain more questions than answers in the study of religion, health and aging. This study contributed to the efforts to understand how religiousness may affect the health of older adults and cancer survivors. Religious salience was found to have both main and moderating effects on depression and disability. High religious

salience was associated with better mental health and was protective against depression resulting from cancer. High religious salience was related to more disability, but was somewhat protective against impairments perhaps as a result of battling cancer. This study benefits from many advantages in terms of the longitudinal design of the dataset and the inclusion of multiple health outcomes, as well as modeling both main and moderating religious effects. Still, there are several notable limitations including a single measure of religiousness, and its time invariant nature. These limitations, as well as recommendations for future research and the potential policy implications are discussed in greater detail in Chapter V. Overall the picture this study paints recalls studies that have discussed, if briefly, the dimensions of nonphysical self that religion emphasizes. In this case it seems that religion may impact perceptions of health rather than realities. This study fleshes this concept out in demonstrating that the very religious are not in better health per se but may have an advantage in navigating health issues surrounding old age.

TABLE 1
Descriptive Statistics of Sample at Study Baseline in 2000 (N=935)

	Mean/Percent	***Standard Deviation***
Demographics		
Male	41.9%	
Female	58.1%	
Mean Age	62.5	8.7
White	87.4%	
African American	9.6%	
Hispanic	3.0%	
Socioeconomic Status		
Education		
Less than high school	17.1%	
High school/GED	36.6%	
Some college	21.9%	
Graduate school	24.4%	
Wealth (average)	$428,704	$910,923
Social Support		
Married/Partnered	87.0%	
Living Children	3.3	1.9
Attends Services	73.7%	
Mental Health		
CES-D Score	1.2	1.7
Physical Health		
Self-Rated Health		
Poor	4.7%	
Fair	12.9%	
Good	28.5%	
Very Good	36.4%	
Excellent	17.5%	
# Functional Limitations	.2	.6
# Chronic Conditions	1.3	1.1
Diagnosed with Cancer	16.2%	
Lifestyle		
Weekly Physical Activity	49.8%	
Current Smoker	13.7%	
Current Drinker	56.6%	
Mean BMI	27.5	5.0

TABLE 2
Demographic Statistics by Religious Salience at Study Baseline in 2000, Reported Means with Standard Deviation or Percentages (N=935)

	Not Important (N=121)	***Somewhat Important (N=252)***	***Very Important (N=562)***	***Significant Difference***
Demographics				
Male	49.6%	42.1%	40.2%	
Female	50.4%	57.9%	59.8%	
Age	61.4(8.7)	62.1(9.3)	62.9(8.5)	
Race				**
White	90.1%	89.7%	77.4%	
African American	1.7%	1.2%	15.1%	
Hispanic	8.3%	9.1%	8.4%	
Socioeconomic				
Education				***
Less than high school	7.4%	20.7%	22.2%	
High school/GED	30.6%	32.5%	36.5%	
Some college	24.8%	22.7%	20.9%	
Graduate school	34.4%	24.1%	20.1%	
Wealth				***
<2,000	6.6%	3.6%	6.6%	
2,001-50,000	7.4%	9.5%	16.0%	
50,001-150,000	14.9%	23.8%	28.3%	
151,001-300,000	20.7%	15.9%	18.9%	
300,000+	50.4%	47.2%	30.25	
Social Support				
Married/Partnered	89.3%	90.1%	85.1%	
Living Children	2.7(1.7)	3.0(1.9)	3.5(2.0)	***
Attends Services	32.2%	59.1%	89.2%	***

+p<.10
*p<.05
**p<.01
***p<.001

TABLE 3
Differences in Health Status by Religious Salience, Reported Mean and Standard Deviation or Percentage (N=935)

	Not Important (N=121)	***Somewhat Important (N=252)***	***Very Important (N=562)***	***Significant Difference***
Mental Health				
CES-D Score	1.16 (1.7)	1.2(1.7)	1.2 (1.7)	
Physical Health				
Self-Rated Health				+
Poor	3.3%	1.9%	6.2%	
Fair	14.1%	10.7%	13.7%	
Good	28.1%	30.6%	27.6%	
Very Good	33.1%	38.9%	35.9%	
Excellent	21.5%	17.9%	16.6%	
# Functional Limitations	.1(.4)	.1(.5)	.2(.7)	+
# Chronic Conditions	1.2(1.1)	1.2(1.0)	1.3(1.0)	
Lifestyle				
Weekly Physical Activity	52.9%	51.2%	48.6%	
Current Smoker	14.9%	14.3%	13.2%	
Current Drinker	68.6%	68.7%	48.6%	***
Mean BMI	26.8 (4.9)	27.5 (5.2)	27.8 (4.9)	

+p<.10
*p<.05
**p<.01
***p<.001

TABLE 4
Poisson Random Effects Regression of Short CESD Score as a Function of Religious Salience and Cancer Diagnosis (N=935)

	Model 1	***Model 2***	***Model 3***	***Model 4***
Religion Somewhat	1.10(.05)*	.99(.04)	1.00(.04)	1.10(.05)*
Religion Very Important[a]	1.03(.05)	.79(.03)***	.83(.04)***	.91(.04)*
Demographics				
Gender (female)		1.50(.04)***	1.41(.04)***	1.49(.04)***
Age		.99(.001)***	.99(.01)***	.99(.01)***
Race[b]				
African American		.93(.04)	.91(.04)*	.92(.04)
Hispanic		1.17(.07)*	1.17(.07)**	1.14(.07)*
Socioeconomic Status				
Education		.92(.01)***	.92(.01)***	.92(.01)***
Wealth		.91(.01)***	.93(.01)***	.94(.01)***
Physical Health				
Self-Rated Health		1.52(.02)***	1.49(.02)***	1.49(02)***
# Functional Limitations		1.17(.01)***	1.16(.01)***	1.16(.01)***
Social Support				
Marital Status			.78(.02)***	.76(.02)***
Attends Services			.91(.03)**	.91(.03)**
Lifestyle				
Exercises at Baseline			.91(.03)**	.92(.03)**
Current Smoker			1.11(.04)**	1.13(.04)**
Current Drinker			.94(.03)**	.94(.03)*
Cancer Diagnosis				1.39(.12)***
Diagnosis*Somewhat				.57(.07)***
Diagnosed*Very Religious				.61(.06)***
Adjusted R-Squared	.007	.17	.18	.18

[a]Reference category is "religion is not too important" compared with "very important" and "somewhat important"
[b]Reference category is White, compared to Blacks and Hispanics
Model 1: Religious Salience Only
Model 2: Demographic and Health Controls
Model 3: + Social Support & Lifestyle
Model 4: + Cancer Diagnosis & Interactions

* p<.05
** p<.01
***p<.001

TABLE 5
Poisson Random Effects Regression of Functional Limitations Measured by Activities of Daily Living (ADLs) as a Function of Religious Salience and Cancer Diagnosis (N=935)

	Model 1	***Model 2***	***Model 3***	***Model 4***
Religion Somewhat	1.41(.18)**	1.56(.20)***	1.96(.29)***	3.63(.82)***
Religion Very Important[a]	2.13(.25)***	1.63(.19)***	2.05(.30)***	3.65(.81)***
Demographics				
Gender (female)		1.11(.07)	.76(.05)***	.73(.05)***
Age		1.02(.01)***	1.02(.01)***	1.02(.004)***
Race[b]				
African American		.98(.09)	.89(.08)	.95(.09)
Hispanic		.70(.12)*	.69(.12)*	.64(.11)*
Socioeconomic Status				
Education		.92(.02)***	.96(.02)	.97(.02)
Wealth		.79(.02)***	.83(.02)***	.84(.02)***
Physical & Mental Health				
Self-Rated Health		2.53(.08)***	1.88(.06)***	1.93(.07)***
CES-D Score		1.23(.02)***	1.23(.02)***	1.23(.02)***
Social Support				
Marital Status			1.14(.09)	1.13(.09)
Attends Services			1.08(.09)	1.13(.10)
Lifestyle				
Exercises at Baseline			.44(.04)***	.46(.04)***
Current Smoker			.82(.08)*	.85(.09)
Current Drinker			.81(.06)**	.82(.06)**
Cancer Diagnosis				3.17(.87)***
Diagnosis*Somewhat				.14(.05)***
Diagnosed*Very Religious				.19(.06)***
Adjusted R-Squared	.05	.28	.32	.34

[a]Reference category is "religion is not too important" compared with "very important" and "somewhat important"
[b]Reference category is White, compared to Blacks and Hispanics

Model 1: Religious Salience Only
Model 2: Demographic and Health Controls
Model 3: + Social Support & Lifestyle
Model 4: + Cancer Diagnosis & Interactions

* p<.05
** p<.01
***p<.001

CHAPTER III

PRAYER, MEDITATION, DEPRESSION AND DISABILITY

PHYSIOLOGICAL PATHWAYS

Introduction

The rise in the use of complementary and alternative medicines (CAM) in the United States is well documented (Astin 1998; Barnes, Bloom & Richard 2008; Eisenberg et al. 1998). CAM is defined broadly as any healing modality used to promote health that falls outside the politically dominant system of a given society. Many studies have attempted to uncover a socio-demographic profile of users (Coulter & Willis 2004), and others have compared users to nonusers in terms of their attitudes and behaviors (Furnam & Smith 1998; Furnham & Kirkcaldy 1996). To date, there are few studies that have examined the extent to which specific CAM practices are used by older adults, and the subsequent long-term health impact. Since prayer and meditation have been considered CAM in alternative medicine research (Tippens, Marsman & Zwickey 2009), are used widely by older adults, and have a theoretical connection to religion and spirituality, this study examines these practices

with respect to depression and disability. This is an interesting avenue of research as it examines the overlap between two bodies of research on religion and CAM. The pairing of prayer and meditation, and their separate examination from other forms of religion, is appropriate as they are theorized to work through similar mechanisms. While religion in the form of religious salience or church service attendance may work through sociological mechanisms including social support and health behaviors, the current study proposes that prayer and meditation work through physiological mechanisms.

Specifically, this study has two primary research aims:

- Aim 1: Investigate the main effects of prayer and meditation on measures of depressive symptoms and functional limitations.
- Aim 2: Investigate the moderating effects of prayer and meditation on the impact of a cancer diagnosis on depressive symptoms and functional limitations.

This study draws on existing research on social stress and support, the mind-body connection, and experimental intervention studies of prayer and meditation. The theoretical framework represents the overlap between sociology and medicine, where prayer and meditation may serve as tools in meaning-making as well as important buffers of stress. The following sections provide background on the use of prayer and meditation, their documented health effects, and the theoretical foundations of this study.

Background

The Health and Retirement Study's survey module on Alternative Medicine administered in 2000 reveals personal practices such as meditation were used by 37% of the sample. Prayer, although considered CAM (Hsiao et al. 2008), is typically not included in CAM research due to its high prevalence. In this analysis of the Health and Retirement Study, 84% prayed and 57% prayed daily in 2000. Given this wide spread use, these behaviors, and particularly their health impact, is an important line of inquiry. It is also a realm rarely explored by sociologists, who in their focus of social factors in health tend not to discuss the mind-body connection (Levin and Vanderpool 1989). Still, as described in the theoretical section of this chapter, Sociology has not been devoid of this topic, which is most evident in the social stress literature.

Defining Prayer and Meditation

Prayer can be defined as the act of connecting to the divine, which may be carried out in the form of words, song, utterance, creed, or silently directing the mind. There are different types of prayer, which is considered a religious practice although may exist outside a formal religion. Prayer is used for many situations such as worshipping, requesting guidance or assistance, confessing sins and expressing a variety of emotions. It may be part of an established ritual or it can be spontaneous or situation-specific. Health researchers have categorized prayer into four distinct categories of prayer: ritualistic, petitionary, colloquial and meditative prayer (Poloma

& Pendleton 1991). Ritualistic prayer may include other behaviors or practices, petitionary prayers are requests, and colloquial prayer is a conversation with God or the divine. Meditative prayers are essentially about expanding awareness beyond one's personal circumstances or difficulties and are also related to connecting to a higher power. For the purposes of this study, prayer is defined as a private practice that takes place out of a social context such as at a religious service. While the data used for this study does not permit a parsing out of various forms of prayer and their effect on health, the inclusion of meditation as another spiritual practice addresses the fourth type of prayer. And, because of the overlap in the practice of prayer and meditation in this data, the practice of meditation is similar to meditative prayer in that the purpose may or may not be connected to an institutionalized religion. Meditation as a practice separate from prayer is one in which a person either concentrates on something separate from the self or observes internal thoughts without judgment, creating a relaxed state (Carlson et al. 2003). Most Eastern religious philosophies such as Hinduism, Buddhism, and Taoism have aspects of meditation (Griffiths 2002), although the practice of meditation in the West does not necessarily have an institutionalized religious component. In fact, since meditation has been investigated by Western scientists, its conceptualization has sometimes been devoid even of spirituality and rather deemed a "relaxation response" (Benson 1975). These overlapping yet conceptually distinct practices, prayer and meditation, represent intriguing social behaviors to study simultaneously and may in fact operate through similar mechanisms. Prayer and meditation are both personal practices that

involve communication or awareness of something beyond individuals and do not necessarily have a uniform belief system accompanying them. Both prayer and meditation may be drawn on in times of need and in day-to-day life to connect to a higher power and emotionally cope. In recent decades empirical research has brought both prayer and meditation into a medical context where both have been purported to have a positive effect on aspects of both mental and physical health (Astin, Harkness & Ernst 2000; Reibel, Greeson, Brainard & Rosenzweig 2001). These studies have largely been case-control and intervention studies that do not offer generalizability to a wider population, but nonetheless have opened the door to the possibility of prayer and meditation being closely related to health. The next section reviews this literature as well as the lesser-understood theoretical mechanisms behind the connection between prayer, meditation and health.

Previous Research

The intersection of belief, behavior and health outcomes is highlighted in research on the health effects of prayer and meditation. Prayer, meditation, and other forms of healing outside the bounds of traditional biomedicine are widely used, especially by older Americans. Recent research offers that 88% of older adults use CAM (Barnes, Bloom & Richard 2008) and 35% of Americans pray regularly specifically for health concerns (Eisenberg et al. 1998). The users of alternative healing are not a homogenous group (Furnham & Kirkcaldy 1996, Ruggie 2004), although CAM users tend to be more educated, have a higher income, and live in the

American west. Women tend to use CAM more for health, as well as certain ethnic groups (Astin 1998; Lee, Lin, Wrensch, Alter, Eisenberg 2000). Practices like prayer and meditation are used especially by those in poorer health and suffering from serious chronic illnesses (Boon et al. 2000). Indeed, with respect to the American population, prayer and meditation may be used not as a regimented religious practice but as a last resort therapy for health issues (Banthia et al. 2007) or the desire for stress reduction. In fact, the most common meditation program used for intervention research is called Mindfulness-Based Stress Reduction (MBSR) and is intended to lower stress, anxiety and mood instability that can lead to depression. Motivation to use prayer and meditation, like other types of CAM, can also be related to the desire a healthier lifestyle and more control over physical and mental health (Cockerham 2007, Ruggie 2004). The effects of these practices on depression and disability have been investigated far less than the socio-demographic profile of those who use them. Depression, which often accompanies and exacerbates chronic illness (Connerney et al. 2001), and disability, which is impacted by depression (Ericsson et al. 2002), are important outcomes to investigate as they relate to prayer and meditation yet have yielded little empirical research in social science fields. This review therefore examines literature more broadly (and therefore more heterogeneous) looking at prayer, meditation and health.

The acts of praying and meditating are not always directly or consciously related to mental or physical health, but their relationship to coping has sparked research studies inquiring into their efficacy in stress reduction. Their relatedness to

stress reduction links it to sociological theories on social stress and support as well as physiological mechanisms that may impact immunity and overall functioning. In terms of the effects of prayer on health in older adults, studies have primarily focused on intercessory or distance prayer on a variety of outcomes including hypertension (Beutler et al. 1988), recovery from coronary artery bypass (Byrd 1988), and depression (Boelens et al. 2009). Overall, a modest majority of studies of intercessory prayer have reported positive effects (Astin, Harkness & Ernst 2000). Still, within this literature at least 14 studies of distant prayer showed either no effect or a nonsignificant negative effect (Masters, Speilmans & Goodson 2006). Studies specific to depression and disability are scarce and although not generalizable[9] still offer a unique contribution to the understanding of prayer and health. A randomized trial of person-to-person prayer on depression and anxiety showed that compared to a nonintervention group, those who were prayed for (with a mean age of about 44 and a history of depression) had significantly lower levels of depression and anxiety, along with higher levels of optimism and spiritual feelings (Boelens et al. 2009). This intervention consisted of a pastor praying with the patient for about one to two hours each week for six weeks. While the two groups were not significantly different at the study baseline, the respondents who prayed group exhibited better outcomes in depression at the end of the study and at the one month follow up. Perhaps more interesting than the quantifiable outcomes in this study is the nature of the prayer sessions for subjects, which were centered on discussing traumatic memories, asking

[9] The lack of generalizability in this study is reflected in the nonblinded sample being 95% women, self-referred, from the Bible Belt.

God for help in alleviating their subsequent negative emotions, and therefore leaving subjects with their memories intact, but the sense that they are "a fact of life without emotional significance" (Boelens et al. 2009: 388). This end product is remarkably similar to the goal of meditation in that thoughts are observed, but without attachment and judgment that leads to suffering.

With respect to physical functioning studies are similarly limited, but unlike the aforementioned studies there has been some recent research on prayer as a personal practice rather than a distant or person-to-person healing ritual. In this sense they are more similar to the current study, which measures prayer as a personal and private practice. Private prayer has been cited as a more sensitive indicator of religious behavior than attendance at services or other rituals (Levin, Lyons & Larson 1994). In a study of female caregivers, higher levels of prayer was associated with fewer health symptoms[10](Banthia et al. 2007). In another study specifically examining personal prayer with health outcomes, higher frequency of personal prayer was positively correlated with better physical functioning (the extent that the individual is able to do physical activities such as walking and exercising) as well as physical role functioning (the extent that the individual can engage in work and leisure), and less depression (Meisenhelder & Chandler 2001). This study, although presenting a wide range of health outcomes, also lacked generalizability in its sampling of pastors.

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[10] Health symptoms in this study were measured by the modified 29-item version of the scale from the Human Population Laboratory in the Alameda County Study (Berkman & Breslow 1983).

Perhaps its greatest contribution is the result that prayer frequency was positively associated with better perceived physical health rather than specific indicators of mobility, which may suggest that prayer is more related to perceptions rather than tangibly impacting physical health.

Prayer studies have cited meditation intervention research as a component of the theoretical or empirical explanations of how prayer impacts health (Boelens et al. 2009). Even the person-to-person prayer intervention study mirrors meditation interventions, which are typically seven to eight week sessions of 90 minutes (Carlson, Speca, Patel & Goodey 2003, Kabat-Zinn 1982). Meditation, and specifically Jon Kabat-Zinn and colleagues' Mindfulness-Based Stress Reduction program (MBSR) that now has over 240 sites in the United States, has been investigated with respect to a variety of health conditions including chronic pain (Kabat-Zinn 1982), anxiety (Miller, Fletcher & Kabat-Zinn 1996) and hypertension, among others (Carlson, Speca, Patel & Goodey 2003). With respect to the outcomes in this study, depression and disability, meditation has been found recently to improve vitality, lessen role limitations from physical health problems and decrease depression among medical patients (Reibel, Greeson, Brainard & Rosenzweig 2001). Meditation has been shown to have both psychological and immunological effects. The Soldberg et al. study (1995) found that meditating moderated the impact of strenuous physical stress on the immune system. Carlson and colleagues found that for breast and prostate cancer outpatients, a MBSR program that included meditation, relaxation, gentle yoga and daily home practice led to improvement in overall quality-of-life and symptoms of

stress (Carlson et al. 2003). A similar study that also used a randomized controlled design and a MBSR program found that the meditation group saw increases in left-sided anterior activation in the brain which relates to positive affect, as well as increased antibodies as a result of administration of a influenza vaccine (Davidson et al. 2003). Furthermore, the brain activation associated with positive affect predicted the antibody production (Davidson et al. 2003). Taken together, these research studies show that meditation may have not only a main or moderating[11] salutary effect on mental health, but also may play a part in immune and physical functioning, perhaps as a result of the positive mental effects.

Limits of Existing Research

The principle difference between the current study and the prior literature on this topic is the use of a longitudinal and nationally representative dataset to detect effects of prayer and meditation on health outcomes. Research to date on prayer has primarily focused on case-control and intervention studies, mainly from fields of psychiatry and psychology, in which person-to-person or distance prayer was investigated. That is, the effect of prayer as a personal and private behavior that may or may not be drawn on specifically for health reasons has not been investigated with respect to older relatively healthy adults. Studies have focused on individuals with existing conditions such as cancer, anxiety or depression. As stated in this review of such research, samples are not generalizable and although such studies have

[11] Main effects are exhibited in studies of healthy populations while moderating effects are demonstrated in high stress populations such as cancer patients and those with clinical depression and anxiety.

contributed greatly to the understanding of prayer and health, most have examined religious samples in social, religious and medical contexts that are not representative of Americans as a whole. Meditation studies are also somewhat limited in their generalizability and, due to the perceived health benefits of meditation have mainly studied the therapeutic effects for a particular condition or set of biological markers. Of course there also exists a significant literature base of complementary and alternative medicine (CAM) use as a whole and much is known now about the demographic profile of CAM users, including differences in attitudes and behaviors of users. Since CAM has been included in a few nationally representative studies the findings on CAM for health are generalizable to the United States population. What this literature lacks is a deeper understanding of how users of CAM therapies as prayer and meditation differ from other older adults in dealing with chronic illness in late life. These limitations do nothing to minimize the contribution of existing findings on prayer and meditation. At the same time, large-scale health surveys have included measures of religion and spirituality creating the opportunity to pursue more quantitative research in religion and health. This study seeks to fill this research gap by studying the effects of prayer and meditation on the acquisition of more depressive symptoms and functional limitations for older adults, while also addressing their potential as buffers of the impact of cancer. By utilizing a social survey, more social and demographic control variables can be analyzed and results are not biased by the nature of the study as in a self-selecting intervention study. Intervention studies are markedly different than sociological studies, and using a medical sociology

framework, the goal of this study is not to detect a therapeutic effect but to determine if variation in health outcomes may be reflecting a larger social context. In this case it is whether people who meditate and people who pray tend to differ in terms of depression and disability.

Variation in depression and disability by these variables would signify them as markers of a social context that impacts health. In this way, more may be discovered about how prayer and meditation compare to other social variables related to health in aging populations, as well as by which mechanisms those practices impact health. Although much of the research described in this review lies outside the discipline of Sociology, sociological theories of social stress and support as well as theory from the field of psychoneuroimmunology provide a theoretical foundation for this study.

Theory

This study investigates the main effect of prayer and meditation on depression and disability, and the role of prayer and meditation in moderating the relationship of a cancer diagnosis to depression and disability. While prayer and meditation are distinct practices and may have very different belief systems and motivations attached to them, both have been theorized to operate though similar mechanisms. Previous research has indentified two key pathways that prayer can impact health: through connection to a divine other and via a physiological lessening of stress (Meisenhelder & Chandler 2001). Meditation also is conceived to effect well-being though the spiritual-philosophical orientations toward nonjudgment and the internal self as well

as through immunological and neurological pathways (Griffiths 2002). These pathways most closely relate to sociological theories of social stress and support in a salutogenic model, and the emergent field of psychoneuroimmunology, which examines psychosocial factors in physiological outcomes such as immune function, neuroendocrine function, and cortisol secretion (Koenig & Cohen 2002). Additionally theory related to meaning-making implies prayer and meditation may influence the impact of cancer as moderating variables. These theories imply that prayer and mediation may have a direct effect on depression and disability and more likely play a moderating role in the relationship of stress (illness) and coping (depression and physical functioning).

Social Stress and Support

The sociological literature on social stress has definitively linked social connections with positive health outcomes (Berkman & Syme 1979; Berkman, Glass, Brissette & Seeman 2000) and social isolation and loneliness with negative outcomes (House 2001). Since prayer and meditation involve a connection to something higher than oneself that is often conceived of as a *relationship*, theory on social support, social stress and health has bearing on the study of prayer and meditation. Of note is the finding that *perceived* social support has perhaps the greatest impact on health (Wethington & Kessler 1986). If God or the divine[12] is perceived as a supporting force, whether though spiritual or material means, prayer and meditation may then

[12] The "divine" can allude to a spiritual concept that is distinct from a religious institution, such as a feeling of oneness or a connection to nature.

boost perceived support and the subsequent salutary health effects. Since perceived support differs from instrumental or actual support received from others, measures of social support are not proposed as an explanatory mechanism in this study. Rather, the perception of support is assumed with the practice of prayer, regardless of whether the prayer is colloquial, petitionary, ritualistic or meditative. The perception of a relationship with God or the divine may differ in the practices of prayer and meditation. Prayer, considered in the Western religious traditions, is a route to communication with a "personal" God that listens and cares for one's well-being (Haskins 1991). Meditation, when considered as a component of the Eastern religious traditions, is a route to the comprehension of the divine where, rather than personally supporting the individual, encourages balance in one's life such as in nature. In fact, while the concept of God or the divine is not necessarily supernatural in the Eastern or oriental religious traditions, it is still beyond one's physical and material self or ego. While prayer may be more of a vehicle for perceived social support than meditation, meditation for Westerners is not necessarily tied with a religious tradition and is thus used as a solution to mental and physical problems. Meditation is conceptualized as a psycho-physiological experience in which concentration or mindfulness without judgment causes a greater understanding of the whole picture, beyond one's personal problems (Kabat-Zinn 1993). In sum, there is a theoretical connection in the relationship between psychological perception of support and the physiological health effects. This is presented in the sociological discipline in the extensive literature on the salutary effect of social networks on health (Cohen et al. 1997; House, Landis &

Umberson 1988; Mendes de Leon et al. 1999), as well as the seminal research by Hans Seyle on social stress heightening susceptibility to disease (1956). These sociological theories are in line with health researchers' conceptions of a relationship with the divine through prayer as a key mechanism in the prayer, meditation and health connection.

Psychoneuroimmunology

A second theoretical mechanism is the physiological effect that affective states can produce in the body as a result of the practices of prayer and meditation. Psychoneuroimmunology, or the study of how social and psychological factors impact neuroendocrine and immune functioning, has recently become a theoretical backdrop for the religion-health connection (Koenig & Cohen 2002). This is because religion has been found to be related to social aspects such as social support and a healthier lifestyle (Koenig 2008) as well as psychological conditions such as well-being and perceptions of health (Krause 2003; Musick 1996). Therefore it is a small step to connect religious practices with both mental and physical health within psychoneuroimmunology. Indeed since religious practice has been found to be associated with greater social support, lower stress, less depression and anxiety and less negative health behavior[13] it is conceivable that religious practices can also produce physiological effects as a result. This theory is intimately tied to the literature on social stress almost to the point of redundancy. That is, religious practice

[13] See reviews in Chapter One.

can influence stress and subsequently positively impact health. There is a rapidly growing literature linking psychosocial factors to natural killer cell activity, immunity, and the progression of cancer (Herberman 2002). Studies of meditation have also exhibited an effect on stress hormones and immunity, causing researchers to remark that meditation techniques appear to reverse the effects of chronic stress (MacLean et al. 1997). While studies of prayer have not been specifically linked theoretically to social-physiological stress connection, studies of "emotional disclosure" (discussing traumatic events) have revealed lower physiological stress (Pennebaker, Hughes & O'Heeronet 1987) and better long-term health (Pennebaker, Barger & Tiebout 1989). Overall findings from the psychoneuroimmunological literature represent another important theoretical link in how prayer and meditation may affect both mental and physical health.

Spiritual Practice, Meaning and Coping with Cancer

As a moderating variable, prayer and meditation may alter the consequences of being diagnosed with cancer. This is exemplified in the reasons individuals use both prayer and meditation for health. Theoretically, prayer and meditation, through their aforementioned connection to the divine or wider religious or spiritual philosophy, may impact health by contributing to an individual's sense of meaning in life. More specifically, prayer and meditation can help manage negative emotions that come with the stress of debilitating illnesses such as cancer. The impact of mental states on the body was documented by Klienman and earlier Engel (Klienman 1988)

in the observation that a strong conviction (even if unfounded or delusional) of dying could cause a swift and unexpected death in patients. With the practices of prayer and meditation, an individual will not necessarily refuse to believe they will die, but will be able to place their situation in a wider context that is supportive and emotionally neutral (Boelens et al. 2009). Medical explanations, particularly for diseases like cancer without a definitive cure, are often supplemented by narrative reconstructions that patients use to psychosocially adjust to illness (Bury 1991). Bury (1982) suggested that viewing medicine as a cultural system, it is both a key resource and a roadblock to finding a deeper meaning in what they are experiencing. Spiritual practices and orientations facilitated by prayer and mediation can thus assist cancer survivors in interpreting their situation and building up their sense of coherence, meaning and manageability (Antonovsky 1979). Cancer patients often draw on spiritual resources through prayer and meditation (Gall & Cornblat 2002). Many religious scriptures and meditative traditions emphasize the growth-related aspects of suffering (Fichter 1981), and these practices can provide comfort and strength in coping with cancer (Albaugh 2003, Overcash, Calhoun, Cann & Tedeschi 1996). Meaning-making through spiritual connection can lessen depression (Nelson et al. 2009) and enhance quality-of-life for cancer patients (Balboni et al. 2007). Imagery associated with praying and meditating that has a spiritual-philosophical context can boost mental and physical health (Droege 1991) and play a part in positive growth from cancer (McGrath 2004). Comparing prayer with meditation in this study presents a unique opportunity to test two practices that may exert similar physiological effects on the body while carrying

differing spiritual or religious meanings. While the use of prayer in the West likely represents an affiliation with a religious outlook, mediation is often used to combat stress. The beliefs and emotions that go along with the practices of prayer and meditation, and the motivation to draw on them in times of illness, theoretically link prayer and meditation as moderators in the relationship between a cancer diagnosis and depression and disability.

Hypotheses

In light of this theoretical framework and the existing empirical research on prayer and meditation, this study tests the following hypotheses:

Hypothesis 1: Higher prayer frequency will correspond to a reduction in odds of acquiring depressive symptoms over time.

Hypothesis 2: Higher meditation frequency will correspond to a reduction in odds of acquiring depressive symptoms over time.

Hypothesis 3: Prayer and meditation frequency will moderate the effect of a cancer diagnosis on depressive symptoms.

Hypothesis 4: Higher prayer frequency will correspond to a reduction in odds of acquiring functional limitations over time.

Hypothesis 5: Higher meditation frequency will correspond to a reduction in odds of acquiring functional limitations over time.

Hypothesis 6: Prayer and meditation frequency will moderate the effect of cancer diagnosis on functional limitations.

Methods

This study attempts to fill research gaps on the topic of prayer, meditation and health by analyzing a nationally-representative sample of older Americans, testing both the main and moderating effects of prayer and meditation on depression and disability for. The dataset, variables used and specific analytical plan are outlined in the section below.[14]

Data and Measures

Data and variables for this study have already been described in the methods section of Chapter One. The present study only examines respondents who, in addition to completing the main HRS survey, also completed the experimental module on Alternative Medicines in 2000, for a total sample size of 935 for the first two aims and 1482 for the third aim specifically examining the cancer survivors[15]. While significantly reducing the sample size, this relatively untouched data portion of the HRS includes measures on prayer, meditation, as well as other religious variables.

The primary independent variables are a cancer diagnosis, prayer and meditation, all which are described previously. Control variables include gender, age, race/ethnicity, education, wealth, marital status, attendance at church services, smoking status, alcohol consumption and weekly exercise. The categories of "pray sometimes" and "pray daily" are compared to those who never pray. Meditation

[14] See Chapter I for a more detailed overview of the dataset used in this study.

[15] The cancer survivor sample uses only the religious salience measure and therefore does not depend on the respondents completing the Alternative Medicine survey with question on prayer and meditation.

frequency is also recoded into three categories based on responses to "do you ever meditate?" and "how often do you meditate?" with "meditators" and "daily meditators" compared to respondents who do not meditate. These independent variables are time invariant due to the fact that the prayer and mediations questions are found only in the Alternative Medicines supplement to the HRS from 2000. The primary explanatory mechanism tested in this study is mental and physical health status, measured by self-rated, CES-D symptoms and functional limitations. Finally, the two outcomes are depression and disability.

Analytical Plan

The statistical analysis used in this study is Poisson regression of covariates predicting the two outcomes, depression and disability. The variant variables are thus measured in terms of change over time. Poisson regression is appropriate for this data primarily because both the variable for depression and functional limitations are count variables that are positively skewed (Allison 2009), although to deal with potential over-dispersion of the dependent variables, I also employ negative binomial regression as a sensitivity test. Because theories of social stress and psychoneuroimmunology suggest that prayer and meditation can impact both depression and functional health via positive mood states and improved immune responses, measures of mental and physical health are added separately to statistical models in a step-wise fashion. This is to test if differences in outcomes by prayer and meditation are primarily due to their impact on physical and mental health overall.

And, since both prayer and meditation are hypothesized to moderate the relationship of a cancer diagnosis to depression and disability, interaction terms of prayer and a cancer diagnosis, and meditation and a cancer diagnosis are added last to models. This plan presents four models total: Model 1 shows only the effect of prayer and meditation frequency on outcomes, Model 2 adds aforementioned control variables, Model 3 adding the explanatory health variables, and Model 4 the contribution of said interaction terms. All statistical models were performed by the author between July 2011 and April 2012 using the statistical package STATA Version 11.

Results

The final study sample includes 935 respondents, 49% of which were male, 87% were White, 10% African American and 3% Hispanic (see Table 1). The mean age at the study baseline was 62.5 years. The sample is highly educated, with 46% having at least some college. The average wealth (excluding housing) is $428,704; 87% were partnered at baseline with an average of 3 living children. In 2000, 73% of the sample attended church services at least once per week. Respondents at baseline had an average of 1.2 depressive symptoms with .2 functional limitations and 1.3 chronic conditions. During the study period (2000-2010), 16.2% of the sample was diagnosed with cancer. About half of the sample exercised at least weekly at the study baseline. In terms of spiritual behavior, 29.2% of the sample reported ever meditating, and of these 53.8% meditate daily. A total of 84.9% of the sample reported praying, 57.9% of which reported daily prayer.

ANOVA with Bonferroni estimates showed that the four distinct groups of meditators, daily meditators, those who pray and those who pray daily were not significantly different in terms of gender, age or race (see Table 2). Meditators were the most highly educated, with 27% of meditators and 25% of daily meditators having some graduate school. Compared to those who practiced prayer, respondents who practiced meditation were also wealthier. Social support was evenly distributed across groups, although those who reported praying daily were the most likely to attend religious services. In terms of health, groups did not differ on depressive symptoms or functional limitations at baseline, although those who prayed tended to have worse self-rated health (see Table 3). Daily prayer was also significantly associated with more chronic conditions at baseline.

Prayer, Meditation and Depressive Symptoms

The initial relationship between meditation, prayer and depressive symptoms was both positive and negative (see Table 4). Daily meditation was associated with a 10% increase in odds of developing an additional depressive symptom ($p<.01$, CI: 1.04-1.19) compared to no meditation. Conversely, those who prayed were 22% less likely ($p<.001$, CI: .72, .84) to develop additional symptoms. When control variables were added to the second model, daily meditators still had about 17% more chance ($p<.001$, CI: 1.09-1.26) of developing an additional depressive symptom, while those who prayed were still 21% less likely to ($p<.001$, CI: .73-.86). These results lend support for Hypothesis 1 but not Hypothesis 2. Females, Hispanics and smokers

were all significantly more likely to get more depressed over time. On the flipside, more education, more wealth, being married and attending religious services reduced odds of acquiring depressive symptoms significantly. The question of how prayer and meditation might have a significant impact on depression is considered with respect to the third model, which introduces physical health variables to the equation. The physical health variables, including self-rated health and functional limitations, did indeed reduce the negative effect of meditation and reduce the positive effect of prayer, and explained an additional 7% of the variance of depressive symptoms. Daily meditation was associated with 12% greater odds ($p<.01$, CI: 1.04-1.19) of developing additional symptoms while prayer was associated with a 15% reduction in odds ($p<.001$, CI: .78-.92) with daily prayer associated with a 10% reduction in odds ($p<.01$, CI: .83-.98). This suggests that physical health accounts for some of the variation in depression for meditators as well as the advantage of prayer. This could signify that meditation might be drawn on in times of poor physical health, while praying may have important emotional or immunological effects that lead also to better mental health. In this model, females were 42% ($p<.001$, CI: 1.34-1.50) more likely than males to develop additional depressive symptoms, consistent with previous research on older adults. While Hispanics were more likely to acquire an additional depressive symptom than Whites, African Americans were less likely to get depressed, consistent with theories that marginalized groups who suffer a life of discrimination may view challenges in later life as less significant (Menaghan 1983). Education, wealth, marital status, church service attendance and exercise appear to buffer

depression, while disability, poor self-rated health and smoking tend to raise odds of depression.

Finally, interaction terms of prayer and meditation frequency and cancer diagnosis tested the moderating impact of both behaviors on how cancer impacts depression. Simply meditating did not alter the relationship between cancer and depression, although for cancer survivors daily meditation was associated with a moderately significant 20% reduction in odds of acquiring an additional depressive symptom ($p=.10$, CI: .65-1.01). Prayer, both generally and daily moderated the relationship between cancer and depression in a salutary fashion. For those diagnosed with cancer, prayer was associated with a 1/3 reduction in odds ($p<.01$, CI: .52-.87) of developing additional depressive symptoms, with daily prayer associated with a 35% reduction in odds ($p<.001$, CI: .53-.81). This lends support for Hypothesis 3 and may be interpreted both as prayer and meditation buffering the effects of cancer on depression and also that the effects of prayer and meditation on depression are much stronger for cancer survivors.

Prayer, Meditation and Functional Limitations

Results paint a different picture for the disability outcome. In the initial model with only the effects of prayer and meditation on functional limitations, meditation corresponded to a moderately significant 16% increase in odds ($p<.10$, CI: .98-1.37) of acquiring an additional limitation over the study period, with daily meditation corresponding to a 24% increase in odds ($p<.01$, CI: 1.07-1.44). And, while daily

prayer corresponded to 46% greater odds (p<.001, CI: 1.21-1.77), respondents who did pray, but not daily, showed a 35% reduction in odds (p<.001, CI: .51-.83) of acquiring a functional limitation (see Table 5).

These results changed only slightly after control variables were added to the model that included demographics, socioeconomic status, social support and health behaviors. Daily prayer was also associated with 1/3 greater odds (p<.01, CI: 1.09-1.62) yet praying sometimes resulted in 30% fewer odds of acquiring a limitation (p<.01, CI: .55-.88), lending partial support for Hypothesis 4. Meditation was also associated with 31% greater odds (p<.01, CI: 1.12-1.55) with daily meditation associated with 33% greater odds (p<.001, CI: 1.14-1.54) of acquiring a limitation compared to the nonmeditating group, partially rejecting Hypothesis 5. There were a number of significant covariates in predicting additional limitations. Females were less likely to see an increase in functional limitations, while older adults were more likely to. Both African Americans and Hispanics had reduced odds of acquiring disabilities compared to their White counterparts. Wealth and education were likewise buffers of disability. The most significant health behavior was exercise, which related to nearly a 70% reduction in odds of acquiring an additional limitations compared to respondents who did not exercise weekly at baseline.

The contribution of physical and mental health variables that were hypothesized to explain the variation in functional limitations by prayer and meditation helped to explain 12% more variation, raising the r-squared value to 33%. In this model, worsening by one level on the 1-5 scale of self-rated health

corresponded to a 72% increase in odds of acquiring a functional limitation (p<.001, CI: 1.59-1.84). Similarly, an additional chronic condition related to a 22% increase in odds (p<.001, CI: 1.17-1.28), and an additional depressive symptom increased odds by 20% (p<001, CI: 1.17-1.24). The effect of adding psycho-physiological variables diminished the effects of daily meditation and occasional prayer to nonsignificant. However, it raised odds of more impairment for meditation to 50% more (p<.001, CI: 1.29-1.84) compared to no meditation and likewise raised odds of daily prayer to 42% more (p<.01, CI: 1.12-1.72) compared to no prayer. This again lends itself to the supposition that the salutary effect of prayer is due in part to a psycho-physiological effect, while meditation, perhaps introduced to individuals later in life, might be used here as CAM to cope with poor physical health in addition to daily prayer. In this fuller model, females, nonwhite and wealthier people have significantly lesser odds of developing an additional functional limitation.

Finally, the moderating effect of both prayer and meditation frequency was tested in interaction terms that were added in the fourth and final model. Hypothesis 6 was rejected. Results generally mirrored previous models in terms of covariates, and no moderating effect was detected for either prayer or meditation in terms of buffering the impact of cancer on disability. For all analyses, negative binomial regression analyses did not reveal distinctly different results from the Poisson regression, and those results are not included in this discussion but are available upon request.

Discussion

The central goal of this study was to determine if there are main or moderating effects of prayer and meditation on depression and disability in older adults. This is the first study that has combined both prayer and meditation in a single study that examines changes in depressive symptoms and functional limitations over time. The additional investigation of the interactions between prayer and meditation with a cancer diagnosis offered the opportunity to test the stress-buffering hypothesis. Psycho-physiological mechanisms were presumed to explain the effect of prayer and meditation on health. Findings showed that both prayer and meditation may impact health, but that only prayer moderates the negative consequences of cancer with regard to mental health.

Overall a large percentage of respondents prayed and almost a third meditated at the study baseline in 2000. Throughout the study period (2000-2010), about one in six developed cancer. At the study baseline, there were few differences between groups who reported prayer, daily prayer, meditation, or daily meditation in terms of mental and physical health with the exception of daily prayer being associated with more chronic conditions. Daily prayer also correlated with the highest likelihood of church service attendance. Compared to those who pray, meditators tended to be more highly educated and have a higher income. This is consistent with literature on CAM use that indicating higher socioeconomic status as a predictor of CAM use (which includes use of meditative techniques).

The first hypothesis stated that higher frequency of prayer would correspond to a lesser likelihood of acquiring an additional depressive symptom. This hypothesis was not confirmed, as prayer was related to lesser likelihood of depression but not in a gradient fashion. That is, prayer in general related to decreased odds of acquiring an additional depressive symptom over time more so than daily prayer. The extent to which physiological mechanisms may be at work, or that prayer might affect mental health through physical health, was found to be small but significant. The advantage of prayer dropped after self-rated health and functional limitations were introduced. Taken together with the baseline health differentials, these findings imply that prayer may influence mental health through perceptions of health and functional ability. This is reflected in prayer intervention studies that have explained the salutary effect of prayer as a manipulation of emotions tied to memories by focused and directed attention (Boelens et al. 2009). In fact, the intention for God to remove negative emotions through prayer through mental effort mirrors the psychotherapeutic effect of meditation (Teasdale et al. 2000).

This leads to the second hypothesis that higher meditation frequency will be tied to a lesser likelihood of an increase in depressive symptoms. This hypothesis did not receive support in the present study and daily meditators actually had greater odds of developing an additional depressive symptom. Although contrary to the proposed hypothesis, a brief look at mounting studies on meditation interventions for depression and anxiety shows that meditation is often used to combat severe depression and anxiety. Meditation in the West does not necessarily encapsulate a

firm religious or spiritual framework and may be used simply as a relaxation mechanism (Benson 1975). This makes it a practice similar but distinct from prayer, which implies a belief in God and more than likely a set of beliefs about said God. Meditators may have a similar desire for meaning and spiritual grounding as those who pray, but lack the internalized belief structure. And as many spiritual traditions intimately connected to meditation foretell, the path of the seeker is indeed a path of suffering (Desikachar 1995). Physical health variables lessened the perceptible negative effect of meditation on depression, suggesting meditation may be used for physical health issues that then manifest mentally. As such, there are a multitude of studies on meditation specifically outlining its therapeutic effect on immune function, pain, and other physical biomarkers of health (Davidson et al. 2003).

In older adults, the experience of cancer is relatively common and entails both physical and mental health consequences, including poorer physical health and increased depression and anxiety (Bodurka-Bevers et al. 2000). This study found that cancer is indeed related to increased depression, and investigated the potential for prayer and meditation to moderate this relationship. The third hypothesis, that prayer and meditation frequency would moderate the effect of cancer on depression, received partial support. Prayer, both in general and practiced daily, served as a buffer against some of the detrimental mental effects of cancer. Both those who pray and those who pray daily had only one-third the odds of their nonreligious counterparts to develop an additional depressive symptom following a cancer diagnosis. Even those who meditated daily had significantly lesser odds of getting more depressed as a

result of cancer, just less significantly than prayer. This supports the stress-buffering hypothesis that in times of higher stress, such as in the context of cancer, religious and spiritual variables will exert a stronger effect. These findings coincide with research on the positive effects of religious and spiritual support on mental health in cancer survivors (Balboni et al. 2010) as well as the social support literature which indicates perceived support is strongly linked to better adjustment to stress (Wethington & Kessler 1986). Both prayer and meditation can feasibly change perceptions through creating meaning, establishing a relationship to the divine and the "bigger picture," and cultivating a nonjudgmental awareness of situations.

While both prayer and meditation can conceivably impact physical health though the established mind-body connection (Harrington 2008), evidence on their protective effect against disability is sparse. This study addresses this in the fourth hypothesis, stating that higher prayer frequency will be related to lesser functional limitations. This hypothesis was not supported by study findings, which were conflicting. While praying sometimes was related to almost one-third lower odds of acquiring a disability compared to those who do not pray, daily prayer was related to one-third greater odds. Knowing it is possible that prayer is drawn on heavily during times of poor physical health or declines in functioning, the results may simply reflect this with an apparent dose effect, although the longitudinal data used addresses this endogeneity. The daily prayer disadvantage in terms of functional health might also be a result of differences in socioeconomic status. Higher prayer frequency was associated in this study with lower socioeconomic status, which was also found in

models to be associated with higher risk of acquiring additional functional limitations. Physical and mental health variables were theorized to explain the link between prayer and disability, because of the impact prayer can have on mental health and perceptions of health. The psycho-physiological mechanisms reversed the effect of prayer on disability, suggesting that prayer may be impacting disability through perceptions. So, in healthy adults prayer is linked to fewer functional limitations but for those in poor health it merely buffers the mental rather than the physical effects of illness.

The fifth hypothesis that meditation frequency would inversely relate to odds of developing an additional functional limitation was not supported by study findings. Meditation both in general and as a daily practice related to 30% greater odds of acquiring a disability. This finding makes sense only taking into account that meditators are more depressed and that depression increases risk of disability (Ericsson et al. 2002). Psycho-physiological variables likewise raised odds for meditators to lose physical functioning, as can be expected if meditation was being utilized to cope with physical illness. This of course reveals a major limitation in this study, which captures prayer and meditation as a time invariant, baseline measures.

The sixth and final hypothesis presumed prayer and meditation would moderate the effect of a cancer diagnosis on disability, testing for a stress-buffering effect. Are the effects of prayer or meditation stronger for cancer survivors who are presumably under more mental and physical stress? There was no support for this hypothesis or the stress-buffering hypothesis for neither prayer nor meditation with

regard to disability. Also unexpected, the lack of moderating effect of prayer or meditation on cancer and disability further affirms the supposition that these private religious, spiritual, or coping practices may be more related to perceptions than physical ability when it comes to health. Another explanation for the relationship between meditation and depression and disability is the idea that those who know they have existing conditions, whether mental or physical, may be inclined to meditate as a coping strategy. While the data do not permit detailed information on the motivations of respondents to meditate, the growing body of studies on the therapeutic effects of meditation for both mental and physical health suggests it's likely that meditation may be used as a healing modality to cope with chronic illness. While in cultures where meditation is part of a religious practice it may be a normal part of life to meditate as a form of religious participation, in the west the practice of meditation does not necessarily infer a religious connotation. Rather, in the context of American culture, meditation is a practice for stress reduction. Taken with the results of this study, those who practice meditation are likely to also be dealing with major life stressors such as disability or depression during the aging process.

The inability to track changes in prayer and meditation over time represents a roadblock in the understanding of these findings. The advantages of longitudinal data are met with equal disadvantages in depth of the key independent variables. Type of prayer and reason for meditating are two potentially defining characteristics that would greatly improve the understanding of how prayer and meditation can impact health. Despite limitations, which are discussed further in Chapter V with regard to

future research and policy, this study contributes to a very sparse literature on prayer, meditation and aging. In fact, this is the first study to examine prayer and meditation specifically using the HRS dataset. Taken as a whole, this study supports theories on perceived support and meaning, demonstrating the influence of spiritual practice on perceptions of health and the aging process.

TABLE 6
Descriptive Statistics of Sample at Study Baseline in 2000 (N=935)

	Mean/%	***Standard Deviation***
Demographics		
Male	41.9%	
Female	58.1%	
Mean Age	62.5	8.7
White	87.4%	
African American	9.6%	
Hispanic	3.0%	
Socioeconomic Status		
Education		
Less than high school	17.1%	
High school/GED	36.6%	
Some college	21.9%	
Graduate school	24.4%	
Wealth (average)	$428,704	$910,923
Social Support		
Married/Partnered	87.0%	
Living Children	3.3	1.9
Attends Services	73.7%	
Mental Health		
CES-D Score	1.2	1.7
Physical Health		
Self-Rated Health		
Poor	4.7%	
Fair	12.9%	
Good	28.5%	
Very Good	36.4%	
Excellent	17.5%	
# Functional Limitations	.2	.6
# Chronic Conditions	1.3	1.1
Diagnosed with Cancer	16.2%	
Lifestyle		
Weekly Physical Activity	49.8%	
Current Smoker	13.7%	
Current Drinker	56.6%	
Mean BMI	27.5	5.0

TABLE 7
Differences in Demographics by Prayer/Meditation Activity at Baseline in 2000
Reported Means and Standard Deviation of Percentages (N=933)

	Prays (N=793)	***Prays Daily (N=541)***	***Meditates (N=273)***	***Meditates Daily (N=147)***	***Sig.***
Demographics					
Male	44.4%	38.6%	41.8%	41.5%	
Female	59.6%	61.4%	58.2%	58.5%	
Mean Age					
White	86.7%	83.2%	82.8%	82.9%	
African American	10.7%	14.1%	14.3%	13.6%	
Hispanic	2.6%	2.7%	2.5%	3.5%	
Socioeconomic					
Education					***
Less than high	17.5%	19.6%	13.9%	14.3%	
High school/GED	37.5%	37.7%	36.9%	36.6%	
Some college	21.3%	19.4%	22.3%	23.8%	
Graduate school	23.7%	23.3%	26.9%	25.3%	
Wealth					**
<2,000	5.9%	7.4%	7.3%	4.1%	
2,001-50,000	13.6%	13.8%	9.9%	8.1%	
50,001-150,000	25.6%	28.1%	27.5%	31.2%	
151,001-300,000	18.3%	20.2%	16.5%	17.0%	
300,000+	36.6%	30.5%	38.8%	39.6%	
Social Support					
Married/Partnered	87.0%	85.2%	85.4%	88.4%	
Living Children	3.4(2.0)	3.4(2.0)	3.4(1.8)	3.3(1.7)	
Attends Services	79.3%	87.0%	80.2%	84.4%	***

*p<.05
** p<.01
***p<.001

TABLE 8
Differences in Health by Prayer/Meditation Activity at Study Baseline in 2000
Reported Means and Standard Deviation or Percentages (N=933)

	Prays ***(N=793)***	***Prays Daily*** ***(N=541)***	***Meditates*** ***(N=273)***	***Meditates Daily*** ***(N=147)***	***Significant***
Mental Health					
CES-D Score	1.2(1.7)	1.3(1.8)	1.4(1.9)	1.5(2.0)	
Physical Health					
Self-Rated Health					*
Poor	4.7%	6.1%	5.9%	7.5%	
Fair	12.6%	14.1%	12.8%	12.2%	
Good	28.8%	29.2%	28.6%	29.9%	
Very Good	36.4%	33.8%	30.7%	29.9%	
Excellent	17.5%	16.8%	22.0%	20.5%	
# Functional Limitations					
# Chronic Conditions	1.3(1.1)	1.4(1.2)	1.2(1.0)	1.2(1.0)	**
Lifestyle					
Weekly Physical Activity	48.8%	46.9%	45.0%	40.1%	
Current Smoker	14.0%	12.2%	15.0%	14.3%	*
Current Drinker	55.2%	49.2%	52.7%	50.3%	***
Mean BMI	27.7(5.0)	28.0(5.3)	27.4(5.1)	26.9(5.4)	**

* p<.05
** p<.01
*** p<.001

TABLE 9
Poisson Random Effects Regression of Short CESD Score as a Function of Prayer and Meditation Activity and Cancer Diagnosis (N=935)

	Model 1	***Model 2***	***Model 3***	***Model 4***
Meditates	.95(.04).	.99(.04)	1.02(.04)	1.04(.04)
Meditates Daily	1.11(.04)**	1.17(.04)***	1.12(.02)**	1.15(.04)***
Prays	78(.03)***	.79(.03)***	.85(.04)***	.89(.04)**
Prays Daily[a]	.98(.03)	.93(.04)+	.90(.04)**	.95(.04)
Demographics				
Gender (female)		1.34(.04)***	1.42(.04)***	1.42(.04)***
Age		.99(.001)***	.99(.01)***	.98(.001)***
Race[b]				
African American		.94(.04)	.86(.04)***	.87(.04)**
Hispanic		1.30(.08)***	1.18(.07)**	1.13(.07)*
Socioeconomic Status				
Education		.87(.01)**	.92(.01)***	.92(.01)***
Wealth		.85(.01)***	.94(.01)***	.95(.01)***
Marital Status		76(.02)***	.78(.02)***	.78(.02)***
Attends Services		.81(.02)***	.84(02)***	.84(.03)***
Lifestyle				
Weekly Physical Activity		.74(.02)***	.92(.03)**	.93(.03)**
Current Smoker		1.17(.04)***	1.11(.04)**	1.10(.04)**
Current Drinker		.82(.02)***	.95(.03)	.96(.03)
Physical Health				
Self-Rated Health			1.49(.02)***	1.46(.02)***
# Functional Limitations			1.16(.02)***	1.14(.02)***
Cancer Diagnosis				1.35(.11)***
Meditates*Cancer Dx				.92(.13)
Meditates Daily*Cancer				.81(.09)+
Prays*Cancer Dx				.67(.09)**
Prays Daily*Cancer Dx				.66(.07)***
Adjusted R-Squared	.01	.10	.17	.18

[a]Reference categories are respondents who do not ever pray or meditate

[b]Reference category is Whites, compared to Blacks and Hispanics

Model 1: Diagnosis, Meditation & Interactions

Model 2: Demographic and Control Variables

Model 3: + Physical Health

Model 4: + Cancer Diagnosis & Interactions

+ p<.10

* p<.05

** p<.01

***p<.001

TABLE 10
Poisson Random Effects Regression of Functional Limitations Measured by Activities of Daily Living (ADLs) as a Function of Prayer/Meditation Activity and Cancer Diagnosis (N=935)

	Model 1	***Model 2***	***Model 3***	***Model 4***
Meditates	1.16(.10)+	1.32(.11)**	1.50(.14)***	1.44(.14)***
Meditates Daily	1.24(.09)**	1.32(.10)***	1.14(.10)	1.18(.11)+
Prays	.65(.08)***	.70(.08)**	.92(.12)	.88(.12)
Prays Daily[a]	1.46(.12)***	1.33(.13)**	1.45(.17)**	1.32(.17)*
Demographics				
Gender (female)		.84(.05)**	.80(.06)**	.76(.06)***
Age		1.04(.003)***	1.02(.004)***	1.02(.004)***
Race[b]				
African American		.93(.08)	.82(.08)*	.87(.09)
Hispanic		.95(.16)	.61(.10)**	.68(.12)*
Socioeconomic Status				
Education		.82(.02)***	.95(.02)+	.96(.02)***
Wealth		.70(.02)***	.86(.02)***	.86(.02)***
Marital Status		.97(.07)	1.13(.09)	1.16(.09)+
Attends Services		.90(.07)	1.05(.09)	1.03(.09)
Lifestyle				
Weekly Physical Activity		.31(.02)***	.45(.04)***	.49(.04)***
Current Smoker		.90(.09)	.80(.08)*	.80(.08)*
Current Drinker		.60(.04)***	.81(.06)**	.82(.06)**
Mental & Physical Health				
Self-Rated Health			1.72(.06)***	1.75(.07)***
# Chronic Conditions			1.22(.03)***	1.24(.03)***
CES-D Score			1.20(.02)***	1.20(.02)***
Cancer Diagnosis				.60(.15)***
Meditates*Cancer Dx				1.63(.47)+
Meditates Daily*Cancer Dx				.95(.23)
Prays*Cancer Dx				1.04(.38)
Prays Daily*Cancer Dx				1.08(.32)
Adjusted R-Squared	.06	.21	.33	.35

[a]Reference categories are respondents who do not ever pray or meditate
[b]Reference category is Whites, compared to Blacks and Hispanics

Model 1: Diagnosis, Meditation & Interactions
Model 2: Demographic and Control Variables
Model 3: + Physical Health
Model 4: + Cancer Diagnosis & Interactions

+ p<.10
* p<.05
** p<.01
*** p<.001

CHAPTER IV

RELIGIOUS SALIENCE AND CANCER SURVIVORSHIP IMPACT ON OBESITY, PHYSICAL ACTIVITY AND LIFE ENJOYMENT

Introduction

Cancer is the second leading cause of death and a prevalent condition among older adults in the United States (Centers for Disease Control and Prevention 2012). Thanks to medical and epidemiological advancement on cancer prevention and treatment, survivor rates of many cancers have increased tremendously in recent years leading to a rapidly growing number of cancer survivors chronically living in the 'remission' society (American Cancer Society 2012). Health behavior, or lifestyle, emerged in the sociological literature decades ago, evoking many theories on the social antecedents of certain lifestyles (Cockerham 2003). Understanding lifestyles is a key research agenda in developed countries in light of gains in mortality that are increasingly due to healthier behavior (Robine & Michael 2004). This has led to the World Health Organization's declaration of this point in history as a post-medical era. That is, lifestyle factors such as diet and physical activity as well as psychosocial factors such as life satisfaction should be taken into consideration within the public

health domain (Cockerham 2007). This study expounds on previous chapters by focusing on religious salience, which has both individual and institutional components, investigating behavioral patterns within the cancer survivor population and the extent to which religion affects enjoyment of life. Among a myriad of social factors, religiousness and spirituality have been widely studied for their impacts on coping with cancer with evidence pointing to beneficial effects both behaviorally and psychologically (Koenig, McCullough & Larson 2001). Meanwhile, healthy behaviors such as physical activity and maintaining normal weight are highlighted as protective factors promoting life satisfaction among cancer survivors. This study primarily examines obesity and physical activity in terms of health and behavior, and uses life enjoyment as an indicator of successful coping with cancer. Specifically, this study has three aims:

- Aim 1a: Investigate the main effect of religious salience on cancer survivors' Body Mass Index (BMI) and likelihood of obesity.
- Aim 1b: Test lifestyle factors in their explanatory power of the relationship between religious salience and BMI/obesity.
- Aim 2: Investigate the main effect of religious salience on cancer survivors' likelihood of engaging in weekly vigorous physical activity.
- Aim 3a: Investigate the main effect of religious salience on cancer survivors' likelihood of enjoying life.
- Aim 3b: Test social support and lifestyle factors in their explanatory power of the relationship between religious salience and life enjoyment.

Background

While cancer accounts for nearly 23% of total deaths in America, a growing number of those diagnosed will survive based on relative 5-year survival rates (Noone et al. 2009). Currently, one in every 20 Americans is a cancer survivor (American Cancer Society 2012). It is a public health priority to investigate the extent to which social factors alter additional health risks specific to this population; survivors are at increased risk of other chronic conditions including other cancers, heart disease, arthritis, obesity and diabetes (McBride et al. 2000). Increasingly, lifestyle factors such as diet and physical activity are attributed as preventive and even causative factors in cancer diagnosis and reoccurrence (Anand et al. 2008). Demographers and sociologists have debated whether the rapidly growing population of older adults who are most affected by cancer are living longer, healthier lives or longer lives more hindered by chronic illness (Jagger 2006; Nusselder 2003; Myers & Manton 1984). Healthy behaviors are one route to disease prevention that may have a greater impact on the lives of survivors than mere biomedical treatment focused primarily on eradication of disease. Evidence has shown cancer diagnoses can induce negative health behaviors, some of which may represent poor coping mechanisms (Blanchard et al. 2003). Yet other studies note positive behavior changes post-diagnosis (Andrykowski 2005; Pinto & Tunzo 2005), due in part to perceptions of lifestyle factors being part of cancer's etiology. While survivors undergo significant distress, this distress may serve as a motivating factor in health-seeking behavior (Patterson et al. 2003; McBride et al. 2000), and cancer survivors may strive for a healthier diet,

more exercise, and smoking cessation (Pinto, Eakin & Maruyama 2000; Nordevang, Callmer, Holm 1992; Gritz 1991).

Cancer has a multitude of physical, social, psychological and spiritual impacts. As quality-of-life becomes more important as a health outcome in light of the increasing prevalence of cancer survivorship, research has examined the psychosocial consequences of living with cancer. Cancer can lead to social isolation and psychological distress, and may be considered a traumatic life event causing heightened depression and anxiety in addition to physical impairment (McCoubrie & Davies 2006). At the same time, the experience of cancer in some individuals may eventually contribute to improved functioning and spiritual growth (Albaugh 2003). In other words, cancer survivorship does not necessarily signify poor quality-of-life or the inability to enjoy life. For example, one study on breast cancer found survivors were no more depressed or socially worse off that women who never had cancer (Bodurka-Bevers et al. 2000), and a more recent line of research suggests that following cancer there is potential for positive changes in self-perceptions, world views, interpersonal relationships and appreciation for life (Morill et al. 2008). Because of the conflicting findings and heightened research on both health behavior and quality-of-life of cancer survivors, this study investigates outcomes of obesity and BMI, physical activity, and life enjoyment. And, because one of the factors identified as a potential influencing force in these outcomes is religiousness, the study tests for differences by religious salience.

Religion, Health Behavior and Quality of Life

Is there a role for religion in preventive health measures and quality-of-life for cancer survivors? This question has led to significant tensions in the religion and health literature, due to theoretical debates and conflicting evidence. Although seemingly disparate outcomes, many of the same religious factors relate to both health behaviors and quality of life. Studies have demonstrated that belief in God as a support system in life can enhance one's ability to cope and adapt to stress (Pargament et al. 1998) and that "life meaning" is linked to positive health behavior in survivors (Park et al. 2008) as well as life satisfaction (Yanez et al. 2009). These results confirm that a belief in God can be a supportive, positive force in one's life that can empower individuals to have better self-care and self-perceptions (Koenig 2007). At the same time, having what has been defined as a "God locus of health control" (Wallston et al. 1999) or the belief in God as having control over one's health, may serve as a hindrance to health-seeking behavior. For example, one study found that women with a high level of belief in God as the controlling source of health were less likely to get breast cancer screenings (Kinney et al. 2002). Those with an internal locus of health control believe they have the power to influence their health situation, while those with an external or God locus of health control (GLHC) believe their outcomes to be the result of external influence. In this vein, highly religious cancer survivors may have a GLHC and be less likely to engage in exercise and maintain a healthy weight. Similar studies suggest that a relationship to God is a hindrance in disease prevention in the absence of other social support (Gullatte et al. 2010).

Two health behaviors that are often examined in cancer survivors are a healthy diet and exercise, due to the negative health consequences of obesity and the positive impact of exercise on quality-of-life. Obesity has reached an epidemic level in the United States, where thirty percent of the adult population has a BMI of over 30 and therefore defined as clinically obese (Flegal et al. 2002, World Health Organization 2012). Furthermore, a third of the population is overweight by the clinical definition (BMI 25>= and <30), adding up to nearly two-thirds of the total population being overweight or obese. Obesity may be to blame for a reversal in the otherwise steadfast increase in Americans' live expectancy (Olshansky 2005). It increases risk for many chronic conditions such as diabetes, heart disease, depression and premature mortality (Ayers et al. 2010) as well as the impairment of mobility (Zagorsky 2004) that can reduce the likelihood of physical activity. Maintaining a healthy diet and engaging in regular physical activity have been highlighted as ways in which cancer survivors cope with the disease (Patterson et al. 2003). Physical activity in particular has been linked to improved physical (Shepard 1993) and psychosocial health of cancer survivors (Pinto & Tunzo 2005; Courneya & Friedenreich 1997; Goldberg & Elliot 1994). Unfortunately, evidence shows that sedentary behavior is common among individuals diagnosed with cancer (Pinto, Eakin & Maruyama 2000).

Little work has been done to examine the associations between religiosity and obesity among cancer survivors. Recent research on religiosity and obesity in general populations has yielded intriguingly mixed results. For example, two recent studies have found religious support is negatively linked to risk of obesity (Ayers et al. 2010;

Debnam et al. 2010). In contrast, Cline and Ferraro (2006) found that church attendance lowered risk of obesity for women but that Baptist church affiliation increased risk for women. Meanwhile, they found that high levels of religious consolation decreased risk of obesity for men. These conflicting results make obesity and physical activity important outcomes to examine by religiousness and are of particular salience in the growing population of cancer survivors. In terms of the impact on quality-of-life, researchers have noted that having a religious orientation can have negative psychological impacts that can interfere with quality-of-life and life enjoyment. For example, if cancer survivors see their illness as punishment by God or if it is a result of behaviors that are against the church dogma, religiousness may be a negative force in coping and maintaining life satisfaction (Koenig, McCullough & Larson 2001). This is a sharp contrast to other research reviewed in earlier chapters of the salutary impact of religious and spiritual factors to well-being, which has spurred researchers to urge for spiritual indicators to be incorporated into measures of quality-of-life (Brady et al. 1999).

In sum, the outcomes of obesity, physical activity and life enjoyment are investigated in the present study due to the propensity for some cancer survivors to demonstrate unchanging or even improved health behaviors and quality-of-life and the documented evidence of religion and spirituality as influential social factors. The following section outlines the theoretical framework for the present study, including alternative hypotheses and proposed mechanisms.

Theory

Theory within the field of religion and health includes broad theories on how religion could impact health such at through integration and regulation, as well as more specific theories on the mediating factors in how belief relates to behavior. (Ellison & Levin 1998). This study is influenced by theories of the Health Belief Model (HBM) and the God Locus of Health Control (GLHC) in examining outcomes of obesity and physical activity. For the life enjoyment outcome, the widely-incorporated mechanisms of social support and health behavior are tested as explanatory factors in the relationship of religiousness to life enjoyment.

Both the Health Belief Model and the concept of a God locus of health provide a rationale for the potential influence of religiousness on the body weight and physical activity of cancer survivors, although they point to opposite predictions. This study does not directly test either theory, rather they suggest that religiousness might exert a main effect on health behaviors, such as physical activity and subsequent risk of obesity. The Health Belief Model (Rosenstock 1966) posits that perceived net benefit of a behavior will increase likelihood of engaging in that behavior. High religious salience may be positively linked to perceived benefits of healthy behaviors such as physical activity and maintaining normal weight. Conversely, high religious salience may be a proxy for having a GLHC, decreasing likelihood of health-seeking behavior and resulting in higher BMI and obesity risk with reduced odds of physical activity. Because of these conflicting theories, rather

than a directional hypothesis, I hypothesize that religiousness will have an independent effect on obesity and physical activity, positive or negative.

Religious participation can provide social support and social control through both formal and informal pathways. Theoretically, social support and health behaviors are mechanisms or pathways in which religious salience might impact life enjoyment. As outlined extensively in Chapter I, the relationship of religiousness with social integration and health is a long-standing concept within sociological literature. Also known as integration and regulation, religious institutions provide a context of socializing and interpersonal relationship building. Additionally, through strict dogmas or more informal social norms, religion instills the value of a healthy mind and body and the promotion of positive health behaviors such as alcohol and tobacco abstinence and healthy diets (Ellison & Levin 1998). This study draws on this theory of integration and regulation to determine if social support and lifestyle are indeed mediators in the relationship between religiousness and life enjoyment. It should be noted that although these mediators may explain variation in life enjoyment by level of religious salience, other theories such as Antonovsky's Sense of Coherence (Antonovsky 1979) and more generally Victor Frankl's work on meaning (Frankl 1992) also present theoretical bases for hypothesizing that religiousness will positively relate to life enjoyment. Sense of Coherence, or a sense of meaning, coherence and manageability in life, has been empirically linked with a vast array of positive mental and physical health outcomes (Antonovsky 1979). Meaning as an independent factor has also been linked to adjustment to cancer (Yanez et al. 2009), subjective well-being

(Ellison 1991) and perceptions of health (Musick 1996). Because of the documented relationship of religious and spiritual participation with Sense of Coherence and meaning-making, I expect that higher religious salience will result in a higher likelihood of enjoying life for older adults who have been diagnosed with cancer.

Hypotheses

Taking into account the existing theories and empirical studies on religion, obesity, physical activity and life satisfaction, the following hypotheses are tested in this study:

Hypothesis 1: Religious salience will have an independent, main effect on obesity risk and BMI of cancer survivors.

Hypothesis 2: Religious salience will have an independent, main effect on the odds of engaging in weekly physical activity for cancer survivors.

Hypothesis 3: Higher religious salience will be associated with higher odds of enjoying life for cancer survivors.

Methods

Data

Data for this study are described previously, in Chapter I. Study sample characteristics were taken in the full sample at baseline in 2000. Statistical models are run for only the sample of cancer survivors, who were diagnosed with cancer at some point in the ten-year study period. After restrictions, the sample yielded 8.422

individuals with 1,482 cancer survivors in the 10th wave (2010).

Measures

Statistical models in this study included a measure of religious salience, various socio-demographic and health control variables, as well as explanatory factors.

Independent variables. The key independent variable of interest is religious salience. Respondents were categorized in three groups based on their response to the question, "how important would you say religion is in your life?" The categories were "not too important," "somewhat important" and "very important." In models the groups that does not consider religion important in their life serves as the reference group.

Control variables. Demographic and health controls included gender, education, race, age, and household income. Females are compared in models to males in the reference category. Education is measured in total completed years of education. Race categories include Hispanics and non-Hispanic African Americans who are compared to Whites. Health status is captured by self-rated health, measured on a scale from 1 to 5, 1 representing "excellent" self-rated health and 5 representing "poor" health. Thus, a one-unit increase in self-rated health in statistical models refers to worsening self-rated health. Two additional measures of physical health include the number of reported chronic conditions the respondent currently has and the number of ADLs (activities of daily living) that a respondent's functional

limitations inhibit. Mental health, measured by depression, is captured by the shortened version of the CES-D.

Mechanisms. Based on previous literature on religion and health, the central proposed mechanism by which religious salience can impact obesity and BMI is lifestyle, referring to health behaviors that may be influenced by religiousness. Lifestyle is measured by smoking status, where smokers are compared to nonsmokers in the reference group, as well as physical activity, and whether the respondent currently drinks alcohol (1=drinks, 0=abstains). Physical activity is a dichotomous measure of whether the respondent gets vigorous physical activity at least once per week. These lifestyle factors are theorized as potentially influential in the relationship between religion and health due to the effect religious participation has on lifestyle factors such as cigarette smoking (Ellison 1991). For the life enjoyment outcome, the proposed explanatory mechanisms are social support and lifestyle. Social support is measured by marital status and number of living children. Lifestyle is measured by smoking, drinking, and exercise status.

Outcome measures. The key dependent variables of interest are obesity, BMI, physical activity and life enjoyment. Obesity is marked by a BMI of 30 or greater, based on the cutoff points outlined by the World Health Organization (World Health Organization 2011). The dichotomous form of this variable is consistent with previous literature (Cline & Ferraro 2006). Life enjoyment is measured by a yes or no response to the "enjoys life" component of the shortened CES-D scale found in the HRS.

Analytical Plan

Logistical regression is employed in this study, testing the extent to which baseline level of religious salience impacts outcomes, controlling for the baseline level of each outcome. For models predicting obesity and BMI, the first model shows the initial relationship of religious salience with outcomes. The second model adds the control variables and the third model adjusts for the contribution of lifestyle factors as explanatory variables. Two models predict physical activity, the first showing the initial effect of religious salience and the second controlling for demographic and health variables. Finally in models predicting life enjoyment, the first model shows the initial effect of religious salience on life enjoyment, the second model adjusts for controls variables, and the third model adds social support and health behavior variables to test for their explanatory power. Logistic regression was employed for dichotomous outcomes (obesity, physical activity, life enjoyment) and regressions were performed for the continuous BMI variable.

Results

The full study sample included 8,422 cancer-free respondents, 17.6% (n=1482) of which were diagnosed with cancer. Although not reported in tables, analyses compared future cancer survivors to adults that would remain cancer-free over the next decade. Results confirmed previous research that those who were diagnosed with cancer had significantly worse self-rated health, more functional limitations and chronic conditions, and worse mental health at the study end point.

There were no differences in these outcomes between cancer survivors and healthy adults at baseline, with the exception of would-be cancer survivors having more chronic conditions at baseline. Although survivors were not statistically different in their lifestyles in 2010, they were more likely to quit smoking during the study, and half of cancer survivors who smoked in 2000 had quit by 2010. Level of religiousness, mental health, or self-rated health at baseline did not predict cancer survivorship. Religious affiliation (not included in final models) was not related to a future cancer diagnosis, nor were there affiliation differences in the mental and physical health of healthy or cancer-diagnosed adults. However, nonreligious adults were actually less depressed at baseline.

Table 11 presents sample statistics of cancer survivors by religiousness. Groups did not differ significantly in their mental and physical health status by religious salience, nor were there significant differences by race or education. More females than males reported religion being important in their life. Household income was inversely related to higher religious salience. The nonreligious were more likely to engage in physical activity, and those who considered religion very important were less likely to be cigarette smokers. The group that considered religion "somewhat important" was significantly more likely to quit smoking after a cancer diagnosis. This is most likely due to the very low rate of smoking to begin with in the "very important" religious group. Notably, BMI grew as salience increased.

Religious Salience, Obesity and BMI

In models predicting obesity (see Table 12), as religious salience increased, so did the likelihood of being obese. In the preliminary model without controls, compared to the nonreligious, the somewhat religious had 1.69 ($p<.05$, CI: 1.10-2.77) and very religious 1.70 times ($p<.05$, CI: 1.05-2.74) the odds of being obese. Controlling for demographic and health status lessened the gradient; the effects of religious salience lessened and disappeared completely when depressive symptoms was added to the model (see Model 2, Table 12). Demographically, females were significantly more likely to be obese, as were those with more chronic conditions. Older and more depressed individuals were significantly less likely to be obese. Depression's inverse relationship to obesity risk may be explained by lack of appetite being a common symptom of depression. When controlling for smoking status and weekly physical activity, the somewhat religious group had 1.57 times the odds of the nonreligious, but not significantly. The very religious had 1.64 times the odds ($p<.05$, CI: 1.21-2.67). Among lifestyle behaviors, smokers were significantly less likely to be obese.

A simple dichotomous measure for obese status may not fully capture the relationship of religiousness to body weight in cancer survivors. To address this, regression models were preformed with BMI as the outcome, controlling for BMI at baseline. In these models (see Table 13), the preliminary analysis showed that as religious salience increased, so did BMI. Each of the religious groups, compared to the nonreligious, saw an increase in their BMI by more than half a point (.6). When

controlling for demographic and health variables (see Model 2, Table 13) only the very religious were significantly different than the nonreligious group. The very religious individuals' BMI rose .7 points ($p<.05$). These findings provide partial support for Hypothesis 1. Older age was related to shrinking BMI ($p<.001$), while increased functional limitations related to significantly increased BMI ($p=.01$). This is understandable as functional limitations may impede mobility and lead to more sedentary behavior. To determine the extent to which these findings are related to sedentary behavior, predictors of physical activity are presented.

Religious Salience and Physical Activity

The initial relationship between religious salience and physical activity was also negative (see Table 14). That is, the more religious, the less likely it was that the survivor engaged in regular physical activity. While the somewhat religious did not differ significantly from the nonreligious, very religious persons were almost half as likely to engage in weekly vigorous activity ($p<.001$, .41-.81). After controlling for demographic, health status and behavior, the very religious had 39% lower likelihood of getting weekly physical activity ($p<.01$, .50-1.18). This provided support for Hypothesis 2. Females, and those with more chronic conditions and worse self-rated health also had lower likelihood of physical activity ($p<.01$). Conversely, higher education was associated with greater likelihood of physical activity. Smokers had half the likelihood of nonsmokers of getting physical activity, and BMI was marginally associated with lesser odds, although not at a significant level.

Religious Salience and Enjoyment of Life

In contrast to the somewhat negative health effect of religiousness in prior analyses, the relationship of salience to enjoyment of life was positive. In the initial model without controls, those who found religion to be somewhat important in their life were on average, 66% more likely to enjoy life (p=.10, CI=.90-3.10), and the very religious were almost twice as likely to enjoy life (p<.01, CI: 1.16-3.34), controlling for baseline mental health score (see Table 15). When demographic and health data was controlled for, this relationship remained, although the effect of being somewhat religious was no longer significant. The very religious remained about 68% more likely to enjoy life (p=.10). This provides partial support for Hypothesis 3, since only the very religious had a detectable advantage. In terms of the effect of the various demographic and health variables in the second model, being female, having worse self-rated health, more functional limitations, and higher education was associated with lesser likelihood of life enjoyment. The theoretical mechanisms of social support, healthy lifestyle or the combination of both were tested in the last model. Indeed, the effect of salience declined to nonsignificance when both lifestyle and social support were controlled for, with social support leading to the greatest drop in the effect of religious salience on life enjoyment in cancer survivors. This suggests that the effects of religiousness on life enjoyment in cancer survivors may be explained by their healthier lifestyle and the social support garnered by their religious participation. In the final model, poor health and functional limitations were associated with lesser likelihood of enjoying life, mirroring the previous model. Of

note, smoking halved the odds of enjoying life, which could be an influential factor in the relationship between higher religious salience and life enjoyment since the highly religious were also the least likely to be current smokers.

Discussion

Results of this study have demonstrated that contrary to literature suggesting the religious are healthier due to differences in lifestyle, increased religious salience in cancer survivors is also associated with obesity and decreased likelihood of physical activity. Furthermore, increased risk in the "somewhat religious" group for obesity disappears when controlling for physical activity. Thus, highly religious individuals with cancer may be a group particularly suited to interventions related to physical activity. The significance of education adds credence to the conclusion that socioeconomic status, rather than religious beliefs per se, is lowering the probability of religious survivors to exercise.

This study indirectly tested two competing hypotheses on variation in health behavior of cancer survivors by religion. The first, the Health Belief Model, suggested that more religious persons would be more likely to perceive a benefit of healthy behavior because of doctrines encouraging abstinence of unhealthy behaviors (i.e. smoking, alcohol). The results do not support this proposition, as the more self-declared religious survivors were less likely to be physically active and more likely to be clinically obese. Conversely, higher religious salience may indicate respondents having a God locus of health control, meaning they would consider their health up to

God. Based on previous research, this suggests that more religious cancer survivors may be likely to engage in behavior to modify their health. The results lend partial support for this theory, however since questions about locus of control or GLHC specifically were not included in the study, it remains an untested assumption. Although in somewhat unexpected ways, the first and second hypotheses garnered support as religious salience was found to be an independent factor for obesity, BMI and physical activity.

Overall, these results are intriguing in lieu of mounting evidence of a salutary effect of religiousness on health. It may be that when it comes to the unique older population of cancer survivors, religious salience exerts different effects on health and health behavior. Reviewing the newly emerging literature on religion and obesity provides some insight on the mechanisms of this paradoxical relationship. For example, it could be that the higher risk of obesity is actually a result of other healthy behaviors associated with higher religious salience. This was proposed by Kim, Sobal and Wethington (2003), who offered that the low rate of smoking might be to blame for obesity among the religious as smoking is associated with reduced appetite. In the same study, they noted that religion might prove to be a safe haven for those who would otherwise be stigmatized, such as the overweight and obese. The current study lends some support for these notions. The combination of smoking status and depression being significantly related to lower obesity risk, suggests that perhaps the salutary effects of religion on mental health and smoking may have a latent consequence on obesity and physical activity. Cline and Ferraro's (2006) study of

religion and obesity also informs this investigation, with the inclusion of a variable for "religious media practice." The idea that many Americans who believe religion is very important get their religion from television media is significant. Since the current study did not include church service attendance as a key independent variable, it remains possible that obese persons are expressing their religious commitment through consumption of religious media, which can be done in isolation, at home, in front of the television and with access to food. Finally, another explanation of the religion and body weight relationship is the influence of region. In the PEW center's recent poll on the most religious states in America, almost all of the top ten religious states were in the American South, which is also known for their "unhealthy" lifestyles[16] when it comes to exercise and food. However, although a worthwhile line of inquiry, research has not supported this link as of yet. Cline and Ferraro found southerners to be less at-risk for obesity (Cline & Ferraro 2006) and the present study did not find significance for census region (which was not included in final models).

The results regarding life enjoyment were on the whole consistent with previous literature on the religion, spirituality and well-being connection (Koenig 2008) and supported the third hypothesis. However, in light of the measurement issues that have plagued many studies on this topic, this study offers an important contribution. In using a measure of religious salience rather than a measure of spiritual well-being, the confounding element of overlap in the two measures is

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[16] Of note here is the contention that lifestyle factors may be over emphasized, which has been heavily criticized (Peto 1980) as victim-blaming. Whereas lifestyle is an important part of wellness in the aged, there are many structural factors in chronic illness that are often downplayed by mainstream medicine (Epstein 1990). This is echoed by medical sociologist Howard Waitzkin and Vavarroo as emphasis on lifestyle excuses larger society from producing negative health consequences (Cockerham 2004).

avoided. In other words, since the importance of religion does not signify a positive emotion or aspect of life satisfaction in and of itself, it can be concluded that there is some evidence of a main effect of religious salience on life enjoyment for cancer survivors. The initially significant and powerful gradient among religious salience and life enjoyment faded partially when demographic and health variables were added, which is echoed in other studies that have suggested that religiousness and spirituality are only factors in life satisfaction in recovered cancer survivors (Yanez et al. 2009). This is demonstrated in a seminal qualitative study by Kathy Charmaz (1983) on the chronically ill. She notes that while those whose cancer improved saw their suffering as a path to knowledge, self-discovery and a new appreciation of life, their counterparts who degenerated did not. She adds that the "structuring of illness in American society fosters learning from the past retrospectively when the individual defines present experiences as improved and more hopeful" (Charmaz 1983: 191). Indeed, the present study showed that the strength of the relationship between religiousness and life enjoyment declined (and for the "somewhat religious" diminished) when physical health variables were controlled for. Specifically, poor self-rated health and more functional limitations were strongly and inversely related to life enjoyment. The results also provided additional support for the proposed theoretical mechanisms of lifestyle and social support. Of course, taken with the results of the health behavior outcomes, it is clear that social support is a stronger mechanism. Since religious institutions promote larger families, earlier and often more robust marriages and strong social networks (Koenig & Cohen 2002), it is

conceivable that it is through social support that religious salience affects life enjoyment. This is not to say that lifestyle is not an important facet in this relationship. Although previous analyses found that physical activity was less prevalent in those who were more religious, there are also fewer smokers in the religious groups and smoking halved the odds of enjoying life. Of course, the direction of this relationship is unclear. While it could be that the religious abstainers are happier in part due to their healthier behavior, it also could be that the more depressed people are more likely to smoke as a coping device and thus be less likely to report that they enjoy life.

There are a number of limitations of note in the present study, that should be addressed in future research. The single measure for religious participation does not reveal more nuanced differences between extrinsic and intrinsic (Allport 1950) religious behavior. Detailed data on church service attendance, region, and consumption of religious media represent additional variables that should be investigated further with relation to obesity and physical activity. Incorporating indicators of how people engage with the divine may help parse out whether belief in God, social support or self-efficacy is most influential in predicting health behaviors of cancer survivors. The study was limited in scope to older, American cancer survivors. This is a distinctive population in terms of health, and future studies that include other chronic illnesses and cultures would lead to a better understanding of which effects are specific to cancer survivors and U.S. based populations. Another serious limitation of this study is that interactions between race/ethnicity and

religious salience were not tested. These should be included in future studies in light of recent studies that focus on specific ethnic populations and how religion impacts body weight (Ayers et al. 2010). Finally, qualitative methodology should be paired with quantitative results like those presented in this paper. In-depth questions in regard to perceptions of obesity and church encouragement of a healthy weight and exercise regime would not only shed light on these results, but help to guide theory in future quantitative studies on this topic. Further recommendations for future research are discussed in the following chapter (Chapter V).

Despite limitations, this study adds to the growing body of literature on religion, cancer survivorship, and health, yielding important policy implications. Researchers have noted the potential public health impact in understanding health behavior of cancer survivors (Park & Gaffey 2007). Leading experts in religion and health have specifically addressed the role that religious institutions may play in the health of our growing aging population (Koenig & Lawson 2004). This study contributes to the research that informs such policy directions. In light of the findings this study presents on the increased risk of obesity and low probability of exercise for religious cancer survivors, religion may be a point of impact when it comes to these behaviors. Policy implications of this trend may include physical activity programs through local churches. While many church doctrines emphasize abstinence of smoking, alcohol and promiscuous sex, recommendations and dogma surrounding physical activity are less emphasized. Notable exceptions include churches such as Mormons (members of the Church of Jesus Christ Latter Day

Saints) and Seventh Day Adventists, who demonstrate how effective church doctrines and norms can be in promoting a healthy body weight.

Additional research is needed in this area to clarify the mechanisms in the relationship of religion and spirituality to the experience of cancer survivors. This study makes a unique contribution to the literature on religion and health by showing that religious salience, although helpful in coping with cancer, may not equate to a healthier lifestyle for cancer survivors. Garnering a better understanding of the role of religion in adapting to cancer may be influential in policies and interventions to improve the lifestyle and quality of life of cancer survivors in the future.

TABLE 11
Differences in Health Status of Cancer Survivors by Religious Salience, Reported Means and Standard Deviation or Percentages (N=1,496)

	Not Important (N=166)	***Somewhat (N=337)***	***Very (N=844)***	***Salience Difference***
Demographics				
Male	53.8%	48.9%	43.9%	*
Female	46.2%	51.1%	56.1%	*
Mean Age	64.0(8.6)	62.4(8.9)	63.9(8.5)	
White	86.7%	82.5%	68.8%	
African American	5.0%	6.0%	23.4%	
Hispanic	8.3%	11.5%	7.8%	
Socioeconomic				
Education				
Less than high school	15.6%	20.7%	22.2%	
High school/GED	30.0%	32.5%	36.5%	
Some college	20.0%	22.7%	20.9%	
Graduate school	34.4%	24.1%	20.1%	
Household Income	$15,797(40,881)	$10,216(32,795)	$6,922(30,066)	**
Mental and Physical Health				
CES-D Score	1.7(2.3)	1.3(1.9)	1.5(1.9)	
Self-Rated Health				
Poor	13.9%	11.5%	12.4%	
Fair	25.6%	21.3%	25.4%	
Good	28.3%	31.9%	33.0%	
Very Good	22.8%	28.7%	22.9%	
Excellent	9.4%	6.6%	6.3%	
# Functional				
# Chronic Conditions	3.0(1.5)	2.9(1.5)	3.1(1.5)	
Lifestyle				
Weekly Physical	29.4%	23.5%	18.7%	**
Current Smoker	11.2%	11.8%	8.7%	**
Mean BMI	26.4(5.3)	27.7(5.9)	27.9(6.0)	*
Social Support				
Married/Partnered	57.8%	63.7%	57.8%	

* p<.05
** p<.01
***p<.001

TABLE 12

Odds Ratios from Logistic Regression of Obese Status (BMI>30) as a Function of Religious Salience, Controlling for Baseline Obesity[a] (N=1,482)

	Model 1	***Model 2***	***Model 3***
Religious Salience[b]			
Somewhat Important	1.69(.46)**	1.36(.38)	1.34(.38)
Very Important	1.70(.41)**	1.53(.39)+	1.55(.40)+
Baseline Obesity	21.37(3.17)***	20.34(3.37)***	21.58(3.67)***
Demographics			
Gender (female)		1.44(.24)**	1.43(.24)*
Age		.94(.01)***	.94(.01)***
Race[c]			
African American		1.10(.24)	1.12(.24)
Hispanic		1.08(.30)	.99(.28)
Married/Partnered		.66(.12)*	.66(.12)*
Economic Resources			
Education (years)		.98(.06)	.95(.06)
Household Income		1.00(.001)	.99(.28)
Mental and Physical Health			
CES-D Score		.90(.04)*	.92(.04)*
Self-Rated Health		1.05(09)	1.07(09)
# Functional		1.18(.10)+	1.19(.11)*
# Chronic Conditions		1.16(.07)**	1.16(.07)**
Lifestyle			
Weekly Physical			.91(.18)
Current Smoker			.48(.13)**
Current Drinker			1.36(.23)+
Pseudo R-Squared	.29	.34	.36

[a]Odds Ratio (Standard Error)

[b]Reference category is "religion is not too important" compared with "very important" and "somewhat important"

[c]Reference category is White, compared to Blacks and Hispanics

Model 1: Religious Salience Only

Model 2: Demographic, SES, Health Controls

Model 3: Lifestyle

\+ p<.10

* p<.05

** p<.01

***p<.001

TABLE 13
Regression of BMI as a Function of Religious Salience[a] (N=1,482)

	Model 1	***Model 2***	***Model 3***
Religious Salience[a]			
Somewhat Important	.62(.33)+	.42(.33)	.40(.33)
Very Important	.60(.29)*	.67(.29)*	.63(.30)*
Baseline BMI	.89(.02)***	.86(.02)***	.85(.02)***
Demographics			
Gender (female)		.09(.20)	.02(.20)
Age		-.09(.01)***	-.10(.01)***
Race[b]			
African American		-.55(.27)*	-.52(.27)*
Hispanic		.09(.35)	.001(.35)
Married/Partnered		-.15(.21)	-.24(.21)
Economic Resources			
Education		.02(.07)	-.004(.07)
Household Income		.001(.001)	.001(.001)
Mental and Physical Health			
CES-D Score		-.06(.05)	-.04(.05)
Self-Rated Health		-.15(.10)	-.15(.10)
# Functional Limitations		.29(.11)**	.29(.11)
# Chronic Conditions		.16(.07)*	.15(.07)*
Lifestyle			
Weekly Physical Activity			-.31(.24)
Current Smoker			-1.35(.32)***
Current Drinker			.19(.20)
Adjusted R-Squared	.62	.65	.66

[a]Reference category is "religion is not too important" compared with "very important" and "somewhat important"

[b]Reference category is White, compared to Blacks and Hispanics

Model 1: Religious Salience Only
Model 2: Demographic, SES, Health Controls
Model 3: Lifestyle

* p<.05
** p<.01
***p<.001

TABLE 14
Odds Ratios from Logistic Regression of Weekly Vigorous Physical Activity as a Function of Religious Salience[a](N=1,482)

	Model 1	***Model 2***
Religious Salience[b]		
Somewhat Important	.76(.16)	.72(.17)
Very Important	.54(.10)***	.61(.13)*
Baseline Physical Activity	2.92(.40)***	2.28(.34)***
Demographics		
Gender (female)		.60(.09)***
Age		.97(.01)**
Race[c]		
African American		1.60(.33)*
Hispanic		1.29(.35)
Married/Partnered		1.17(.19)
Economic Resources		
Household Income		1.00(.001)
Education		1.16(.07)**
Mental and Physical Health		
CES-D Score		.97(.05)
Self-Rated Health		.71(.06)***
# Functional Limitations		.92(.11)
# Chronic Conditions		.85(.05)**
Body Mass Index		.98(.01)+
Current Smoker		.47(.13)**
Current Drinker		1.31(.20)**
Pseudo R-Squared	.05	.15

[a]Odds Ratio (Standard Error)
[b]Reference: Not Important
[c]Reference: White

Model 1: Religious Salience Only
Model 2: Demographic, SES and Health Controls

* p<.05
** p<.01
***p<.001

TABLE 15
Odds Ratios from Logistic Regression of Enjoying Life as a Function of Religious Salience[a] (N=1,482)

	Model 1	***Model 2***	***Model 3***	***Model 4***
Religious Salience[a]				
Somewhat Important	1.66(.51)+	1.42(.46)	1.44(.47)	1.31(.44)
Very Important	1.98(.53)**	1.68(.49)+	1.68(.49)+	1.51(.46)
Baseline CES-D Score	.69(.03)***	.76(.03)***	.76(.04)***	.76(.04)***
Demographics				
Gender (female)		.64(.14)*	.62(.14)*	.67(.16)+
Age		.99(.01)	.98(.01)	.99(.01)
Race[b]				
African American		1.79(.58)+	1.69(.55)	1.81(.61)+
Hispanic		.75(.24)	.67(.21)	.64(.21)
Socioeconomic Status				
Education		.83(.07)*	.83(.07)	.83(.07)*
Wealth		1.10(.09)	1.06(.09)	1.04(.09)
Physical Health				
Self-Rated Health		.63(.07)***	.62(.07)***	.63(.07)***
# Functional		.82(.07)*	.78(.07)**	.79(.07)**
Lifestyle				
Current Smoker			.47(.14)**	.49(.15)**
Current Drinker			1.01(.23)+	1.02(.23)
Weekly Physical			.96(.29)	.94(.28)
Social Support				
Married				1.37(.33)
Living Children				.97(.04)
Pseudo R-Squared	.11	.16	.17	.18

[a]Reference category is "religion is not too important" compared with "very important" and "somewhat important"
[b]Reference category is White, compared to Blacks and Hispanics

Model 1: Religious Salience Only
Model 2: Demographic, SES, Health
Model 3: Lifestyle
Model 4: Social Support

\+ p<.10
* p<.05
** p<.01
***p<.001

CHAPTER V

CONCLUSIONS, FUTURE RESEARCH

AND POLICY IMPLICATIONS

This study has contributed to the understanding of the practices and mechanisms that are related to coping with the aging process. The United States is undergoing a significant transition in which there are increasingly large proportions of older adults (Kinsella & Phillips 2005). This has social, political, and economic ramifications that urgently need to be dealt with (Bongaarts 2004, Koenig & Lawson 2004). There are a growing number of individuals surviving debilitating illnesses such as cardiac disease, diabetes, Alzheimer's and especially cancer (Benjamins et al. 2004). The rising costs of health care coupled with a shrinking percentage of older adults living with children that provide care is leading to a dramatic shift in provision of health care needs to the elderly. At the same time, research has demonstrated that the impact of social support and lifestyle are among the most important factors in coping with and preventing disease. For example, social networks are linked to improved survival (Berkman & Syme 1979) and better mental health (Koenig 1997),

while social isolation contributes to depression and exacerbates the effects of disability (House 2001). Health behaviors such as smoking and alcohol use have been linked with increased cancer risk, while a healthy diet and regular physical activity can help prevent cancers and other diseases (Anand et al. 2008), in addition to improving quality-of-life (Courneya & Friedenreich 2007). Stress has also been linked to disease progression, depression, and physical functioning, whereas techniques such as meditation (Speca et al. 2001) and social relationships (House, Landis & Umberson 1988) reduce stress. This concluding chapter reviews the contributions of these studies to these pressing issues, as well as their limitations and potential policy implications. While more research is needed in this area, there are many creative applications to research on religion and health.

Review of Study Results

This study was conducted in response to these issues of disease, disability, depression and health behaviors in the American elderly population. Specifically it indentified religion and spiritual practices as having a potential role in buffering the effects of old age. This research was guided by mounting studies on the salutary effects of religion on health (Koenig 2008), and contributed to the literature by using a longitudinal design, a nationally-representative sample, and testing specific pathways in which religion might affect health. The outcomes examined were depression and

disability for their prevalence and salience with respect to quality-of-life for the aged. Additionally this study examined cancer survivors in particular and investigated the effect religion may have on physical activity, obesity and life enjoyment. These outcomes were targeted due to their relationship to disease prevention and quality-of-life as documented in the oncology literature. The outcomes examined as well as the longitudinal nature of the study set it apart among others, and the national sample represents a key advantage of the study.

Results of this study demonstrated a salutary effect of religious salience on depression, which was partially explained by social support and healthy behaviors. Religious salience also moderated the negative impact of cancer on depression. Older adults with higher religiousness were more likely to be disabled, although they were less likely to acquire more impairment after getting diagnosed with cancer. In addition to religious salience, two spiritual/health practices, prayer and meditation, were also examined with respect to the same outcomes. People who prayed regularly but not daily were less likely to get more depressed as they aged, which was partially explained by physiological mechanisms. In other words, the effect might be due to the impact prayer has on physical health. Conversely, those who meditated were more likely to become more depressed and more disabled, but this effect lessened when physical health was taken into account. This result may correspond to research suggesting mediation is used as a strategy for treating specific medical or psychological conditions (Speca et al. 2000). Compared to older adults who do not pray at all, people who pray either sometimes or daily had only a third of the odds of

acquiring an additional depressive symptom following a cancer diagnosis. While occasional prayer corresponded to a reduction in physical functioning, those who reported daily prayer were the most likely to have multiple impairments. Likewise, meditation also predicted more disability, in part explained by their increased depression. Neither praying nor meditation buffered the physical impairments related to cancer. Looking at cancer survivors in particular, religious salience was related to higher BMI, higher obesity, and lesser likelihood of physical activity. Conversely, the more religious cancer survivors were more likely to enjoy life with cancer, which was partially explained by social support.

Study Limitations and Recommendations

This study was the first of its kind to examine religious salience, prayer and meditation in the same study using a longitudinal design and national sample. It contributed to existing literature by testing specific theoretical mechanisms and additionally testing a moderating effect in terms of the impact of cancer. And, it stands out among other studies on the health behavior of cancer survivors by using a representative sample without a specific intervention. These contributions certainly represent strengths of the study, but it is of course not without notable limitations which hopefully will serve to guide future research on religion, health and aging.

The measures of religion in this study represent a key constraint and limitation of the data used. Although religious salience is an important measure of religiousness, it does not specifically distinguish between extrinsic or intrinsic religiousness or

positive or negative religious coping. The addition of personality variables might contribute to a better understanding of how individuals use religion to cope. It may be the case that the more optimistic or resilient individuals are the ones who benefit from their religious orientation. This study creatively used church service attendance as a mediating factor and social support measure. Service attendance has been established as a protective factor for depression and disability in previous studies, but a major critique of this finding is that attendance is merely a proxy for good health or social support rather than a measure of beliefs or attitudes toward religion. Affiliation was also not incorporated into the final version of this study because of its failure to account for any differences in any of the outcomes examined. This suggests that for Americans, religiousness in general, rather than a specific belief set, is most salient in regard to health. That said, this study is limited to older Americans, and these results cannot be generalized to other cultures or age groups. Future studies therefore should include other nations and greater diversity in religious affiliation. It may be that the significant differences are found between religions that simply do not have enough members in the present sample to test for variation. In terms of religious measures, they should be captured at every time point in a longitudinal study, unlike the present study which could only account for religious practice and salience at the study baseline. Tracking outcomes over time with religious measures taken at baseline is a step up from cross-sectional studies, but ideally future studies should track both religion measures and health outcomes over time.

This was the first study to investigate prayer and meditation using the HRS survey data. These variables were constructed using data from an added survey module that a smaller proportion of the entire sample answered. If religious and spiritual variables were included in the main survey, the study sample would greatly increase. Due to the salience of religion and spirituality to older adults, surveys of this population most certainly should include measures of religious and spiritual behavior. With respect to the survey questions on prayer and meditation, it would be of great use to future studies to inquire about the type of prayer and reasons for meditation. This would help clarify how prayer is linked to health and parse out who uses meditation because of distress and who uses it to successfully prevent it. Other recommendations include testing additional theoretical mechanisms in greater detail, such as meaning and sense of coherence, which have been examined before and produced fruitful findings (Strang & Strang 2001). Since the nature of spirituality is immensely complex, the combination of quantitative and qualitative methods would contribute to a greater understanding of the reflexive relationship between religion and health.

Applications and Policy Implications

Despite the limitations of the present study, its findings, when taken together with existing research, have several unique clinical and community-level applications. Clinical applications have to do with how health care providers can respond to the spiritual needs of older adults, taking into account the potential health benefits.

Health practitioners (HPs) should be sensitive to patients' spiritual beliefs, respecting them as a potential health buffer. While certain religious beliefs interfere with treatment (Gullatte et al. 2010), this should not be assumed on the part of HPs. Spiritual histories can be helpful in identifying how the person uses religion to cope and can aid in appropriate referrals. Religion does not equal better mental health or lessened impairment, but becomes increasingly important to older adults suffering from serious illnesses. Religious support should be mobilized during these times, when patients are likely to be cut off from their religious community due to hospitalization or physical impairment.

Community and social applications of religion and health research can play a major part in adapting to the health care crises provoked by the rapidly aging population. Churches are already established social networks that can be drawn on by members for support both socially and materially. Churches are often the site of exercise and diet educational programs that emphasize disease prevention. The high prevalence of obesity found in more religious cancer survivors suggests church members may benefit from a greater emphasis and availability of exercise programs and nutritional counseling. Who will perform these services, and with what money? There is always the potential for public and private funding sources, but the best application of medical sociological research is through volunteering. This study confirms the positive impact of spirituality, social support and a healthy lifestyle. This, coupled with the wealth of studies on the salutary effect of volunteerism (Musick & House 1999) and the emphasis on helping others placed by most religious traditions,

can have a dramatic effect on the quality of life of older adults (Koenig & Lawson 2004). Churches should help stimulate efforts to recruit retirees to serve as parish nurses focused on preventive health, aids in transportation and HP-patient communication, friends and confidants. Other services that churches and volunteers could provide include adjustments to housing, permitting disabled older adults to remain at home, close to churches and friends and allowing for a more dignified sense of self without social isolation that can lead to depression.

This study utilized the approach of medical sociology to investigate the role of religion in coping with and preventing depression and disability that can accompany aging. Although not without limitations, it contributes to sociological literature as well as other fields such as gerontology, psychology and oncology. It also provides further evidence of the role of social support and health behaviors in coping with old age, which has innovative but realistic policy implications. Religion and spirituality should not be considered effective cures or preventive practices against depression and disability, but their utility in providing social support, motivation toward healthy behaviors and frameworks for meaning may play a significant role in tackling the nations health care and aging concerns. As a social institution, religion has long been considered by mental health professionals and the medical institution to be debilitating to health (Blazer 1973). With more social and health science research demonstrating salutary effects, the result is a convergence of medicine and religion that is a distant echo of two institutions that in their beginnings were one and the same (Koenig, McCullough & Larson 2001). This convergence warrants future study,

as religious and spiritual variables continue to serve as key factors in coping with the process of aging, contributing to a more meaningful and socially connected life.

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